INTRODUCTION TO INTEGRATIVE ONCOLOGY

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DISCLAIMER
Traditional complementary and integrative medicine (TCIM) is a professional medicine. Laypersons interested in availing themselves of the treatments described in this book should seek out a qualified professional practitioner. All ethical TCIM practitioners work with oncologists and surgeons to ensure the best outcomes for patients.
It is a pleasure to be invited to write the Foreword to Daniel Weber’s book on integrative oncology. As a medical oncologist with over 30 years’ experience, I am acutely aware that many of my cancer patients, perhaps most, are interested in what is now technically termed ‘complementary and alternative medicine’ (CAM). Studies of cancer patients in Australia show that at least half use CAM to some extent, mostly without confiding in their medical practitioners. They do not confide for various reasons, amongst them being fear of incurring their practitioner’s opprobrium; a desire to use medicines in keeping with the patient’s ethnic or cultural background which may differ from that of their oncologist; or a belief that CAM does not come under the purview of those with Western medical qualifications.

However the medical profession is coming to realise that it must take an interest in CAM, not least in relation to cancer treatment. We need to do so to understand what patients are taking, because – despite common claims – complementary and alternative medicines may not always be safe or harmless. Further, undoubtedly some forms of CAM, not currently accepted by the medical profession, will prove to be effective; the problem is that most CAM have not yet been tested according to scientific principles, so we do not know if they are beneficial or detrimental. That many of the prescription medications now in use for specific and supportive treatment of cancer patients are derived from ‘natural’ products indicates almost certainly that others are out there waiting to be discovered. Well-established examples include morphine and derivatives from the opium poppy and the anti-cancer agent vincristine from the Madagascar periwinkle. Many more discoveries will come from investigation of traditional medicines, especially those from time-honoured non-Western medical systems such as traditional Chinese medicine and Ayurvedic medicine.

In his exposition Daniel first gives a comprehensive background to orthodox Western scientific understanding of cancer biology. He then describes in some detail the basic principles of certain traditional medical systems, concentrating on Chinese and Ayurvedic medicine. Studies of CAM in cancer treatment (the integration of such treatments with Western or orthodox medicine – ‘integrative oncology’) are then described. Both positive and negative reports are dispassionately catalogued. There follows a comprehensive annotated listing of CAM methods and medicinals from both ‘Western’ and Chinese practice – a veritable catalogue raisonné. Finally, the reference listing is wide-ranging and copious.
Daniel is to be congratulated on the research that has led to the production of such a comprehensively documented exposé. If made widely available, the information within this work would be valuable to a range of health practitioners. In this one volume orthodox and CAM practitioners can learn about each others’ approaches to cancer management. The annotated commentaries could allow oncologists like myself to give useful advice to their patients on possible benefits and dangers of various types of CAM.

I hope the work does indeed reach a wide audience and I applaud Daniel on his achievement.

(Prof) Ray Lowenthal AO (Order of Australia)
Hobart
# CHAPTER CONTENTS

**Introduction** .............................................................................................................. 1

**Chapter 1**

*What disciplines are participants in cancer treatment?* .................. 3
- Orthodox Medicine / Medical Oncology .............................................. 4
- Traditional Medicines ........................................................................ 7
- Complementary Alternative Medicine (CAM) ................................ 8
- Traditional Complementary Alternative Medicine (T-CAM) .......... 11
- Discussion ............................................................................................. 12

**Chapter 2**

*Cancer Defined* ................................................................................................. 23
- Orthodox Medicine ............................................................................... 24
- Orthodox Medical Issues in Oncology ............................................. 29
- Integrative Definitions ......................................................................... 36

**Chapter 3**

*CAM and Cancer* ............................................................................................... 64

**Chapter 4**

*Application of Therapies* ............................................................................... 71
- Orthodox Medicine ............................................................................... 72
- Traditional Medicines .......................................................................... 72
  - TCM .................................................................................................. 72
  - Ayurvedic Medicine ........................................................................ 83
- CAM / Supplements ............................................................................ 90-92
  - Compounds and Supplements in Chemotherapy ....................... 94
  - Homeopathy ..................................................................................... 95
  - Discussion ......................................................................................... 96
**Table Index**

**Table 1**  
Selected adverse reactions of some complementary medicines .................. 15

**Table 2**  
Cancer Statistics:  
Five–Year Disease–Free Survival Rates According To Cancer Therapy .. 31-34

**Table 3**  
Global Cancer Statistics, 2002 ................................................................. 35

**Table 4**  
Global Cancer Facts & Figures 2007 .......................................................... 36

**Table 5**  
Historical understanding in Chinese medicine ......................................... 37

**Table 6**  
TCM organ patterns associated with cancer ............................................. 42-45

**Table 7**  
Bu fa or reinforcing body resistance / tonifying;  
consolidating the constitution ................................................................. 74-75

**Table 8**  
Gong fa, eliminating pathogenic agents: Toxic Heat Removing .............. 76-77

**Table 9**  
Gong fa, eliminating pathogenic agents: Blood Activating ..................... 78

**Table 10**  
Gong fa, eliminating pathogenic agents:  
Regulating Qi and Eliminating Phlegm .................................................... 79-80
Table 11
Gong fa, eliminating pathogenic agents:
Liver Qi Stagnation & Melancholia .......................................................... 81

Table 12
Gong fa, eliminating pathogenic agents:
Softening Lumps & Dispelling Nodules .................................................. 82

Table 13
Compounds Isolated from Chinese Herbs ........................................ 83

Table 14
Physiologic Functions Assigned to the Three Doshas ......................... 84

Table 15
Herbs used in Ayurveda with proven anticancer properties ............... 87-89

Table 16
Biological Compounds ........................................................................ 91

Table 17
Supplements (food micro-nutrients) .................................................... 93

Table 18
Effect of Alkylglycerols following Radiation Therapy ..................... 110

Table 19
Herbs, Compounds and Supplements in Chemotherapy ............... 114-125

Table 20
Herbal Agents - Immune Modulatory Effects Reported ................. 167-168
We are a society of cells that cooperate for the benefit of the whole, the self. Cancer breaks the rules of cooperation and takes over the organism without regard for the community of cells as a whole. The host, the self may die due to the aberrant behaviour of a single cell and a pathological environment, which fosters its proliferation. Cancer is the name for many diseases, however all cancers share common traits. Cancer cells differ from normal cells in two defining characteristics; they continue to divide in spite of natural constraints, which control healthy cells and they leave their origins and invade distant tissues and establish new colonies, new tumours.

Cancer cells are unstable and by many accounts immortal. They can be killed, of course but they have overcome a normal cell’s programming to only reproduce a set number of times. Normal cells may be programmed to divide 60 or so times and then enter senescence. We die of old age because our cells stop replicating. Cancer is the price we pay for having cells that continually repair and renew themselves. Genes, which program the cell to exactly replicate itself, control the renewal process and when the program is wrong and the cell overcomes natural checks on reproduction the aberrant cell is created. In each cycle of replication the cells become increasingly unstable.

When this community of cancer cells grows it meets a limitation, it will need a blood supply. Tumours create an environment, which stimulates blood vessels to grow and feed the tumour. This is called angiogenesis.

The invasion by cancer cells from the primary tumour is called metastasis and it is this activity that ultimately destroys the host. Although an original tumour may throw one million cells a day into the lymph and blood stream only .00015% take hold in a distant site. Almost all are killed by the body’s immune system and it is the defeat of the immune system, which concerns everyone with cancer.
There is considerable evidence that chronic inflammation plays a critical role in initiation, growth, angiogenesis and metastasis. Cancer is a wound that does not heal and cancer cells turn the immune system around to fuel their own growth.

Cancer is a disease of old age as each time a cell replicates there is an opportunity to distort and to let the damaged DNA get passed on to the next generation. The environment that these aberrant cells find themselves will determine their survival. Cancer cells do not take hold in a healthy environment. The environment is the somatic (physical), emotional (psychological) and the social; what we eat, what we do, how we relate, how we feel.

Cancer is complex and without a single cause, it takes many major insults to the cell and to the self to produce a single aberrant cell and to foster its survival to spread.
CHAPTER 1

WHAT DISCIPLINES ARE PARTICIPANTS IN CANCER TREATMENT?

Orthodox Medicine / Medical Oncology ..................................................... 4
Traditional Medicines...................................................................................... 7
Complementary Alternative Medicine (CAM).............................................. 8
Traditional Complementary Alternative Medicine (T-CAM) ....................... 11
Discussion......................................................................................................... 12
Integrative Medicine, according to the Australasian Integrative Medicine Association (AIMA, 2008), is “the integration of holistic and complementary medicine within current mainstream medical practice, in pursuit of a complete whole person care”. The Society for Integrative Oncology (SIO, 2008) defines integrative oncology as the use of complementary therapies and botanicals for cancer patients. It further states that “modalities in the discipline known as integrative medicines include traditional medicine, complementary medicine (T-CAM)” and “it makes a clear distinction between ‘alternative’ or unproven and ‘complementary’ or tested useful therapies in cancer care” (SIO, 2008).

The use of complementary and alternative medicine (CAM) by cancer patients has increased in recent years (Ernst & Cassileth, 1998). Many cancer patients use CAM (Burstein, Gelber, Guadagnoli, & Weeks, 1999; Cassileth, Schraub, Robinson, & Vickers, 2001). In order to encourage open communication of CAM use by their patients, oncologists as well as CAM practitioners should be knowledgeable about the most commonly used remedies and their effect and interactions with orthodox medicines, or at least be able to direct patients to reliable sources of information such as Memorial Sloan-Kettering Cancer Centre (http://www.mskcc.org/mskcc/html/44.cfm), the Office of Cancer Complementary and Alternative Medicine at the National Cancer Institute (http://www3.cancer.gov/occam), and the National Institutes of Health at the US Department of Health and Human Services (http://www.nih.gov/).

**ORTHODOX MEDICINE (OM)**

The US National Cancer Institute (NCI, 2009a) defines Orthodox Medicine (OM) as “a system in which medical doctors and other healthcare professionals (such as nurses, pharmacists, and therapists) treat symptoms and diseases using drugs, radiation, or surgery”. OM is also known as “conventional medicine, Western medicine, mainstream medicine, biomedicine, and allopathic medicine” (NCI, 2009a).

OM is the practice of preventing, diagnosing, and treating disease, both physical and mental; also any substance used in the treatment of disease. The basis of medicine is anatomy; the structure and form of the body and physiology; and the study of the body’s functions (Jones, 2004).

**MEDICAL ONCOLOGY (MO)**

Since 1987 the American Joint Committee on Cancer (AJCC) and the International Union Against Cancer (UICC) have promoted a worldwide taxonomy of cancer staging based on localised tumour characteristics, nodal involvement, and the status of metastatic implants (Hutter, 1987). The group stage in the
tumour-node-metastasis (TNM) system is based on a combination of locoregional tumour involvement and the presence of metastases (Greene, Stewart, & Norton, 2004).

Denoix conceived of the TNM system in 1946 (Casali, 2009), while Karnofsky in 1949 codified the concept of tumour response and patient performance status (KPS) (Karnofsky & Burchenal, 1949) and Papanicolaou lent his name to the test commonly called the Pap smear in 1943 (Papanicolaou & Traut, 1943). These contributions could arguably have constituted the basis of a “clinical method” in oncology (Greene, Stewart, & Norton, 2004).

Further developments in the clinical method were Muller’s proposal that cancer arises from a single cell that has received multiple mutations (Muller, 1927, 1948), the discovery and description of the Philadelphia chromosome by Nowell and Hungerford in 1960 (Nowell & Hungerford, 1960) and Rowley’s identification of the mechanism by which the Philadelphia chromosome arises, as a translocation (Rowley, 1973).

Medical oncology is the application of the clinical method and is manifested in these distinct disciplines: surgery, radiation therapy, chemotherapy, multimodality and adjuvant chemotherapy and gene therapy (Beers et al., 2006).

**Interventions**

**Surgery**

Surgery is the oldest form of effective cancer therapy (American Cancer Society (ACS, 2008a). It may be used alone or in combination with other modalities and in the case of a primary tumour in which metastasis has not occurred, surgery may be curative. Establishing a complete margin of normal tissue around the primary tumour is critical for the success of primary tumour resection (Beers et al., 2006, p. 1158). Although the surgical oncologist is part of a team, they often take the role of the primary cancer care provider (Niederhuber, 2008, p. 407).

**Radiation Therapy**

Radiation cannot destroy malignant cells without destroying some normal cells as well (Puck & Marcus, 1956). Therefore, the risk to normal tissue must be weighed against the potential gain in treating the malignant cells. The final outcome of a dose of radiation depends on numerous factors, including nature of the delivered radiation (mode, timing, volume, dose) and properties of the tumour (cell cycle phase, molecular properties, overall sensitivity to radiation).
In general, cancer cells are selectively damaged because of their high metabolic rate, and normal tissue repairs itself more effectively, resulting in greater net destruction of tumours (Beers et al., 2006, pp. 1158-1159; Sharma, Vallis & McKenna, 2008, p. 423).

Examination of the radiotherapy data provides some interesting insights. About 380,000 patients in the U.S.A. were treated with radiotherapy in 1980: 200,000 for palliation and 180,009 with intent to cure. By our estimates, only 90,000 of the latter group are, in fact, curable. It is interesting to note that, of the 90,000 who were not curable, some 60,000 patients can be expected to relapse as a result of recurrent disease in the treatment field, while only 30,000 will have recurrent disease in sites distal to the primary (DeVita, 1983, p. 2405).

Systemic Therapy.

Systemic Therapy is defined as chemotherapy, hormonal therapy or targeted therapy (Freter & Perry, 2008, p. 449). The ideal chemotherapeutic drug would target and destroy only cancer cells. Unfortunately, few such drugs exist. Single-drug therapy may cure selected cancers (e.g., choriovacarcinoma, hairy cell leukaemia) (Chu & Sartorelli, 2006, p. 878). More commonly, multidrug regimens incorporating drugs with different mechanisms of action and different toxicities are used to increase the tumour cell kill, reduce dose-related toxicity, and decrease the probability of drug resistance (Beers et al., 2006, p. 1161, p. 1166).

Multimodality and Adjuvant Chemotherapy

In some tumours with a high likelihood of relapse despite optimal initial surgery or radiation therapy, relapse may be prevented by addition of adjuvant chemotherapy. Increasingly, combined-modality therapy e.g., radiation therapy, chemotherapy, surgery is used. It may permit organ-sparing procedures and preserve organ function (Calais et al., 1999).

Adjuvant chemotherapy is systemic chemotherapy given after initial surgery to eradicate residual occult tumour (“adjuvant chemotherapy”, n. d.). Patients who have a high risk of recurrence may benefit from its use. General criteria are based on degree of local extension of the primary tumour, presence of positive lymph nodes, and certain morphologic or biologic characteristics of individual cancer cells (Freter & Perry, 2008, p. 455). Adjuvant chemotherapy has increased disease-free survival and cure rate in breast and in colorectal cancer (Beers et al., 2006, p. 1167).
Chemotherapy is the newest of the treatment modalities in current use. It is generally used in four broad ways: (1) as curative therapy in some patients with clinically evident disseminated malignancy; (2) as a curative therapy, to some degree, in clinically evident but localised malignancies when used in combination with surgery and radiotherapy; (3) as a palliative therapy in patients with clinically evident disseminated malignancy; and (4) as a means of delaying recurrences in surgically treated patients who are at high risk for developing recurrences (DeVita, 1983, p. 2405).

Gene Therapy

Genetic modulation is under intense investigation. Strategies include the use of antisense therapy; systemic viral vector transfection; DNA injection into tumours; genetic modulation of resected tumour cells to increase their immunogenicity; and alteration of immune cells to enhance their antitumour response (Beers et al., 2006, p.1168).

TRADITIONAL MEDICINES (TM)

About 80% of the population of the developing countries still use traditional medicines (TM) for their health care (Kim, 2005). The rational use of traditional medicines in primary health care should be based on the Guidelines for the Assessment of Herbal Medicines as developed by the World Health Organization (WHO), which defines TM as:

The sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. (WHO, 2002).

Traditional use of herbal medicines refers to the long historical use of these medicines (WHO, 2008a). Their use is well established and widely acknowledged to be safe and effective, and may be accepted by national authorities (WHO, 2003).

A distinction needs to be made between the highly codified traditional medical systems, such as Chinese herbal medicine and traditional Indian (Ayurvedic) medicine, and the oral transmissions of primitive cultures, or folk medicines. China, India, Tibet, Persia all possess a long historical development of rational, empirically based understandings of their medicines, which have been recorded and analysed over millennia, and they have developed a system of
science pertinent to their cultural understanding (Grant, 2004). China and India in particular show systematic development in codifying botanicals and disease independent of “spiritual” or metaphysical qualities, which inhabit many folk medicines (Waldstein & Adams, 2006). TM is based on analytic models and methods that are rationally defined, internally coherent, and make testable predictions, therefore meeting current definitions of “science”. In an anonymous editorial in the journal Nature (1999, p. 623) entitled Caution: traditional knowledge. Principles of merit need to be spelt out in distinguishing valuable knowledge from myth, it was stated:

What makes knowledge “scientific”, and thus distinguishable from other forms? This question has relevance well beyond the philosophical, with the scientific nature of data having an increasing significance in issues ranging from the reproducibility of discoveries for which patents are being applied, to the argument that environmental regulations should be based on “sound science”.

The question also overshadows the growing recognition that “traditional knowledge”, such as folk remedies for illnesses, deserves greater respect from modern science than it often receives. But such acceptance also requires due caution, and a rigorous assessment of more and less deserving forms of traditional knowledge.

The possibility of multiple, complementary sciences is a consequence of certain findings in physics that have led to a view of science as a set of tools, instruments of social activity that depend on learned agreement in aims and methods, rather than as a monolith of absolute objective truth (Loizzo & Blackhall, 1998).

Ayurveda (AM), the traditional Indian medicine, and traditional Chinese medicine (TCM) remain the most ancient yet living traditions (Patwardhan, Warrude, Pushpangadan, & Bhatt, 2005). These are the two great traditions with sound philosophical, experiential and experimental basis (Patwardhan, 2005). China has been successful in promoting its therapies with a more research and science-based approach, while Ayurveda still needs a more extensive scientific research and evidence base (Patwardhan et al., 2005).

**COMPLEMENTARY ALTERNATIVE MEDICINE (CAM)**

CAM is a term for forms of treatment, which are used in addition to (complementary) or instead of (alternative) standard treatments (National Centre for Complementary and Alternative Medicine (NCCAM, 2007a). These practices generally are not considered standard medical approaches (Ernst & Cassileth,
Orthodox treatments go through a long and careful research process to prove they are safe and effective, but less is known about most types of CAM (NCI, 2009a). CAM may include dietary supplements, mega-dose vitamins, herbal preparations, special teas, acupuncture, massage therapy, magnet therapy, spiritual healing, and meditation (NCI, 2009a; Universitatwitten/Herdecke n.d.).

According to the US Office of Cancer Complementary and Alternative Medicine (OCCAM, 2008), major categories of CAM therapies include:

1. Alternative Medical Systems (Traditional Medicine) which are built upon complete systems of theory and practice (NCCAM, 2007a). Often, these systems have evolved apart from and earlier than the conventional medical approach (Barnes, Powell-Griner, McFann, & Nahin, 2004, p. 2). Examples include: Acupuncture, Ayurvedic, Homeopathy, Naturopathy.


3. Energy Therapies which involve the use of energy fields (NCCAM, 2007a). There are two types.
   a. Biofield therapies are intended to affect energy fields that purportedly surround and penetrate the human body (Hibdon, 2005, p. 196). The existence of such fields has not yet been scientifically proven. Examples include: Qi gong, Reiki, Therapeutic touch (Pierce, 2007).
   b. Electromagnetic-based therapies involve the unconventional use of electromagnetic fields, such as pulsed fields, magnetic fields, or alternating current or direct current fields. Examples include: pulsed electromagnetic fields, magnet therapy (Munshi, Ni, & Tiwana, 2008).

4. Using exercise therapies as an adjunctive treatment for quality of life and mental health enhancement has not been extensively investigated with cancer survivors, although the limited evidence that does exist has been positive in outcome (Daley, Mutrie, Crank, Coleman, & Saxton, 2004). Schmitz et al recently concluded twice-weekly weight training is a safe exercise program for recent breast cancer survivors that may result in increased muscle mass, as well as decreased body fat % and IGF-II. The implications of these results on cancer recurrence or survival may become more evident with longer exercise intervention trials among breast cancer survivors (Schmitz et al 2005). In an Australian study it was concluded that physically active and
healthy weight breast cancer survivors report better quality of life (QoL) than their inactive and obese counterparts soon after completing adjuvant therapy (Milne et al. 2007). In another study Courneya and Friedenreich in The journal of Alternative and Complementary Medicine found that (a) functional QoL was the least possessed but most important QoL dimension underlying overall satisfaction with life (SwL), (b) exercise levels decreased from pre-diagnosis to active treatment and then increased from active treatment to post-treatment but not back to pre-diagnosis levels, and (c) permanent relapers reported the lowest QoL of the four main exercise patterns. It was concluded that cancer treatment has a negative impact on exercise levels and that those previously active individuals who fail to reinitiate exercise after cancer treatment experience the lowest QoL 1 to 4 years later (Courneya and Friedenreich 2007). The American College of Sports Medicine recommends that adults should exercise between three and five times per week at moderate intensity (Pate et al., 1991), and Courneya (2000) in his exercise prescription guidelines for cancer survivors recommends 20–30 min of continuous exercise on at least 3 to 5 days per week.

5. Manipulative and Body-Based Methods in CAM are based on manipulation and/or movement of one or more parts of the body. Examples include: chiropractic, therapeutic massage, osteopathy, reflexology (Yarbro, Goodman, & Frogge, 2005).

6. Mind-body Interventions use a variety of techniques designed to enhance the mind’s capacity to affect bodily function and symptoms (NCCAM, 2007b). Examples include: meditation, hypnosis, art therapy, biofeedback, mental healing, imagery, relaxation therapy, support groups, stress management, music therapy, cognitive-behavioural therapy, dance therapy, aromatherapy (Wolpert, 2005).

7. Nutritional Therapeutics incorporate an assortment of nutrients and non-nutrients, bioactive food components that are used as chemo-preventive agents, and the use of specific foods or diets as cancer prevention or treatment strategies (Temple & Balay-Karperien, 2002). Examples include: dietary regimens such as macrobiotics, vegetarian, Gerson diet, Kelley/Gonzalez regimen, vitamins, dietary macronutrients, dietary supplements, soy phytoestrogens, nutrient minerals and elements (amino acids), antioxidants, glutamine, selenium, coenzyme Q10, orthomolecular medicine (Clifford & McDonald, 2001).

8. Pharmacological and biologic treatments utilise off-label use of prescription
drugs, hormones, complex natural products, vaccines, and other biological interventions not yet accepted in mainstream medicine (Cohen, Morrow, & Penna, 2006; OCCAM, 2008). Examples include: anti-neoplastins, products from honeybees, mistletoe, shark cartilage, 714X, low dose naltrexone, metenkephalin, immunoaugmentative therapy, laetrile, hydrazine sulfate, and melatonin (Eisenberg, 2001).

9. Complex Natural Products, which are an assortment of plant samples (botanicals), extracts of crude natural substances, and un-fractionated extracts from marine organisms used for healing and treatment of disease. Examples include: herbs and herbal extracts, mixtures of tea polyphenols, and shark cartilage (Moore, 2003)

10. Spiritual Therapies are among the most frequently used in the US. Prayer, spiritual healing, and meditation are the most frequently used spiritual therapies. Equivocal evidence supports their efficacy (Taylor, 2005). Cancer patients will often use religious and spiritual resources (RSR) and complementary and alternative medicine (CAM). Patients’ beliefs about the relationships among RSR, CAM, and conventional treatments may reflect belief systems not readily apparent to physicians (Tatsumura, Maskarinec, Shumay, & Kakai, 2003).

Categories 1, 2, 8 and 9 will be expanded in subsequent sections.

TRADITIONAL COMPLEMENTARY ALTERNATIVE MEDICINE (T-CAM)

T-CAM is the whole spectrum of non-orthodox medicine including herbs, compounds, supplements and nutritional substances (nutraceuticals) to treat disease as well as maintaining well being (preventative medicine) (Galantino, Boothroyda, & Luccia, 2003).

Herbs are crude plant material such as leaves, flowers, fruit, seed, stems, wood, bark, roots, rhizomes, other plant parts and in some cultures animal by-products and/or animal parts and are a primary medical system (Gurib-Fakim, 2006). These may be entire, fragmented or powdered, fresh juices, gums, fixed oils, essential oils, resins and dry powders of herbs. In some countries, these materials may be processed by various local procedures, such as steaming, roasting, or stir baking with honey, alcoholic beverages or other materials. Herbs may be extracted and concentrated without changing the structure (Vogel, 1991; Zhang, X., et al., 2002).
Compounds are the specific molecular extracts from herbs, which target specific receptors (Peter, 2004). Compounds are biological drugs (Chavan, Joshi, & Patwardhan, 2006) and therefore botanical medicine is the use of both herbs and compounds, which are designated as having specific therapeutic effect.

Meanwhile supplements are by definition those factors, which are nutritional and supplement dietary needs. They include vitamins, minerals, antioxidants and other nutrients. Nutraceuticals is a term used to broadly define the whole area of biological agents used in complementary medicine. The term nutraceutical is attributed to Stephen DeFelice, founder and chairman of the Foundation for Innovation in Medicine (FIM), combining the word nutraceutical from nutrition and the word pharmaceutical, in 1989 (Brower, 1998).

Nutraceuticals can therefore be defined as a food (or part of a food) that provides some medical or health benefits, including the prevention and/or treatment of some diseases, usually chronic but are not pharmaceutical drugs (Brower, 1998).

The Office of Cancer Complementary and Alternative Medicine (OCCAM, 2008) states that supplements maintain health while botanical medicines treat diseases, making the distinction between supplements and botanical medicine. It would appear however, in the clinic, the distinction is less clear. Many supplements and nutraceuticals have been shown to treat disease, independent of their signs of deficiency (Dillard & German, 2000; Kalra, 2003; Whitman, 2001).

**DISCUSSION**

In the United States total spending on orthodox medicine was US$2.4 trillion in 2007, or $7,900 per person and total healthcare spending represented 17% of the gross domestic product (GDP) (Commission on a High Performance Health System, 2009; Heffler et al., 2004). In Australia, last report 2004, the cost per person was A$2,000 and health spending now consumes 9.3% of Australia’s GDP (Horvath, 2006).

Therapeutic compounds used in support of orthodox medicine (OM) are of importance rather than stand-alone alternatives. In a computerised literature search reported by Ernst in 2000 a total of 26 surveys from 13 countries, including 4 studies of paediatric patients, were examined. The use of CAM therapies in adult populations ranged from 7% to 64%. The average prevalence across all adult studies was 31.4% (Ernst, 2000). A sizeable percentage of patients receiving conventional treatments for cancer also use complementary therapies
and their satisfaction with complementary therapies was high even without the hoped for anticancer effect (Downer et al., 1994).

An editorial in the New England Journal of Medicine in 1998, suggests that what stops alternative medicine from contributing to oncology is that it has not been scientifically tested, with the marshalling of rigorous evidence of safety and efficacy and by peer-reviewed scientific journals for the publication of research reports (cited in Angell & Kassirer, 1998). It goes on to say there cannot be two kinds of medicine — conventional and alternative. There is only medicine that has been adequately tested and medicine that has not, medicine that works and medicine that may or may not work. Once a treatment has been tested rigorously, it no longer matters whether it was considered alternative at the outset (Angell & Kassirer, 1998).

However, in a rebuttal, Eliason (1999) suggests a more rational approach to herbal medicine, noting that in the USA herbs are not regulated as they are in Germany, much of the European Community, China, Japan and Australia. Considerable research on herbal medicine — including double blind, placebo-controlled trials is ongoing (Blumenthal, Busse, & Goldberg, 1998). As of February 2009, a search in Google Scholar produced over 8,000 articles on double blind and herbs.

A 1998 study indicated that up to 137,000 hospitalised Americans die annually and up to 2,711,000 become seriously ill as a result of adverse reactions to “properly prescribed and administered” prescription drugs (Lazarou, Pomeranz & Corey, 1998). The authors concluded that, even by the most conservative estimates, adverse drug reactions are the 6th leading cause of death in the United States while the few adverse reactions to herbs or vitamins reported annually pale in comparison with the many millions of adverse reactions to prescription drugs (Posner, 1999).

In a more recent study, 36% of 815 consecutive patients on a general medical service of a university hospital had an iatrogenic illness. In 9% of all persons admitted, the incident was considered major in that it threatened life or produced considerable disability. In 2% of the 815 patients, the iatrogenic illness was believed to contribute to the death of the patient (Steel, Gertman, Crescenzi, & Anderson, 2004).

Articles and reviews on the side effects of herbs and supplements are numerous and ask if physicians are aware of these side effects (Silverstein & Spiegel, 2001) but little hard evidence suggests this is of major concern when over 80% of cases of fulminant hepatic failure presenting for liver transplant (or death)
over ten years in the United Kingdom were due to poisoning by freely available over-the-counter non-prescription, non-steroidal anti-inflammatory (NSAID) drugs, such as paracetamol and aspirin; not one case was due to ingestion of medicinal herbs (Brinker, 1983).

Research in botanical medicines now exceeds 940 published articles in PubMed, the term *complementary alternative integrative medicine* yielded 265 articles, and a search using *cancer herbs* produced 61 articles (all retrieved February, 2009). A wider search in Google Scholar using the term *cancer herbs* produced over 46,000 articles, which includes books, review articles, foreign language sources and commercial journals.

In the *British Medical Journal*, Tang, Zhan, and Ernst (1999) did a review of the randomised controlled trials (RCT) in Chinese medicine and found 2,938 RCT were identified in the 28 selected journals. They found the number of trials had doubled every two to three years over the past 15 years and the number of randomised controlled trials published in all 100 journals by the end of 1996 was estimated to be around 7,500. Comparison of hand searched trials with trials of traditional Chinese medicine found in electronic databases shows that journals of conventional medicine in China published about a quarter of the number of randomised controlled trials published in journals of traditional Chinese medicine. Thus, almost 10,000 randomised controlled trials were published in China before 1997. But biases are present both in placebo-controlled trials of Chinese herbal medicines (CHM) and conventional medicine, but may be most pronounced in CHM trials published in Chinese-language journals. Only a few CHM trials of adequate methodology exist and the effectiveness of CHM therefore remains poorly documented (Shang, Huwiler, Nartey, Jüni, & Egger, 2007).

**Interactions**

While potential danger exists in herb/supplement (HS) interactions with chemotherapeutic agents, HS use in patients receiving chemotherapy was common, 78% (McCune et al., 2004), but no hard numbers are available to provide evidence of dangerous interactions.

A recent South Australian survey found that 52% of adults had used at least one complementary medicine the previous year, and 57% had not told their doctor about their use of these products (MacLennan, Wilson, & Taylor, 2002). Complementary medicine products have not been subjected to the pre-registration evaluation of efficacy and adverse effects required for pharmaceuticals. Since there is a lack of systematic data, together with a perception of safety
and frequent non-disclosure of use to medical practitioners, there may be unrecognised adverse effects occurring with complementary medicines (McEwen, 2004).

In Australia, the term *complementary medicine* includes many herbal products, vitamins, minerals, amino acids and essential oils. Most complementary medicines are regulated by the Therapeutics Goods Administration (TGA) to ensure that they conform with lists of permitted ingredients, and are manufactured under the same standards as pharmaceuticals.

Some complementary medicines have well-recognised adverse effects.

**Table 1**

*Selected adverse reactions of some complementary medicines*

<table>
<thead>
<tr>
<th>Complementary medicine</th>
<th>Adverse reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aristolochia species</td>
<td>Renal failure</td>
</tr>
<tr>
<td>[not permitted in Australia]</td>
<td></td>
</tr>
<tr>
<td>Bee products</td>
<td>Anaphylaxis</td>
</tr>
<tr>
<td>Black cohosh (Cimicifuga racemosa)</td>
<td>Liver impairment</td>
</tr>
<tr>
<td>Echinacea species</td>
<td>Allergic reactions</td>
</tr>
<tr>
<td>Ginkgo biloba</td>
<td>Interaction with warfarin - bleeding</td>
</tr>
<tr>
<td>Guarana (Paullinia cupana)</td>
<td>Caffeine overdose</td>
</tr>
<tr>
<td>St John’s wort</td>
<td>Reduced efficacy of cyclosporin, oral contraceptives; Serotonin syndrome with SSRIs, tramadol</td>
</tr>
<tr>
<td>[Hypericum perforatum]</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adverse Drug Reactions Advisory Committee (ADRAC), 2005.

These effects may be either predictable, as in the case of overdoses from the caffeine in guarana, or idiosyncratic, such as allergic reactions to Echinacea (ADRAC, 1999). Some reactions with complementary medicines may be serious or life threatening. Two recent Australian cases have been published of liver failure requiring transplantation with Cimicifuga racemosa (Lontos, Jones, Angus, & Gow, 2003).

Complementary medicines may also interact with prescription medicines, for example St John’s wort may lead to reduction in plasma concentrations of a number of medicines, including cyclosporin and oral contraceptives, and may cause serotonin syndrome when used with SSRIs or tramadol (Fugh-Berman,
A large number of herbs, including garlic (Allium sativum), Korean ginseng (Panax ginseng), and Ginkgo biloba have documented interactions with warfarin (Fugh-Berman, 2000); and there is some evidence that glucosamine and cranberry juice (Vaccinium species) might increase the activity of warfarin as well (Suvarna, Pirmohamed, & Henderson, 2003).

Herbs, compounds and supplements must have therapeutic activity, which refers to the successful prevention, diagnosis and treatment of physical and mental illnesses; the improvement of symptoms of illnesses; as well as beneficial alteration or regulation of the physical and mental status of the body (Zhang, et al., 2002).

Sixty nine percent of anticancer drugs approved between the 1980s and 2002 are either natural products or developed based on knowledge gained from natural products (Newman & Cragg, 2007). Arguably, about three quarters of plant-derived drugs in clinical use today came to the attention of pharmaceutical companies because of their use in traditional medicines (Abelson, 1990).
References


What disciplines are participants in cancer treatment?


Memorial Sloan-Kettering Cancer Centre (http://www.mskcc.org/mskcc/html/44.cfm)


Papanicolaou, G. N., & Traut, H. F. (1943). Diagnosis of Uterine Cancer by the
What disciplines are participants in cancer treatment?

79-83.
CHAPTER 2

CANCER DEFINED

Orthodox Medicine ................................................................. 24
Orthodox Medical Issues in Oncology ...................................... 29
Integrative Cancer Definitions .................................................. 36
ORTHODOX MEDICINE (OM)

History

The Greek term *carcinoma* is the medical term for a malignant tumour derived from epithelial cells. Hippocrates is credited with coining the term carcinoma (Barthel, 2005). It was Celsus (25 BCE-50 CE), who translated *carcinos* into the Latin *cancer*, also meaning crab. Galen (129-216 CE) used *oncos* to describe all tumours, the root for the modern word *oncology* (Karpozilos & Pavlidis, 2004).

Celsus, a native of Greece and citizen of Rome, published *De Medicina* in the 1st century CE. He recommended aggressive surgical intervention for cancer but he believed that only at the early stage could these tumours be removed. He cautioned that even after excision, and when a well-healed scar is formed, breast carcinomas may recur with swelling in the armpit and cause death by spreading into the body (Hajdu, 2004).

A more modern interpretation of cancer began in the 19th century when French physicians proposed that tumours were secondary to infectious agents and cancer hospitals were closed out of risk of spreading the disease (Meyer, n.d.).

Surgical oncology was developed by Scottish surgeon John Hunter who in 1789 suggested surgical resection of tumours were possible if the tumour was moveable, that is, if its resection did not damage adjacent normal tissue (Yalamarthi & Smith, 2005).

Management of cancer has changed drastically since the end of World War II. From the turn of the century up to that time, surgery had been the intervention against cancer. Now, over 2,000 medical oncologists and over 1,000 radiologists in the United States play a large role in cancer management (DeVita, 1983).

Paget’s 1889 proposal (see Fidler, 2003) that metastasis depends on cross talk between selected cancer cells (*the seeds*) and specific organ microenvironments (*the soil*) still holds forth today. It is now known that the potential of a tumour cell to metastasise depends on its interactions with the homeostatic factors that promote tumour-cell growth, survival, angiogenesis, invasion and metastasis.

More recently Workman and Collins (2007, p. 3) claim we live in an “incredibly exciting era for cancer drug discovery and development…”. They go on to point out the molecular targets of contemporary drugs reflect understanding of genes and pathways responsible for tumour initiation and progression.
and lead the way to personalised molecular medicine through identification of biomarkers.

**Definition and Origin**

Cancer occurs in most, if not all, multicellular animals (Barthel 2005; Cairns, 1998). Evidence from fossil records reveals bone cancers in dinosaurs, and sarcomas have been found in the bones of Egyptian mummies (ACS, 2002).

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues or metastasise. Cancer is a disease of the cell, a cell that is out of control, but it is not only the single-cell itself but also the community of cells that create tumours (Busch, 1962). Cancer is not just one disease but many diseases (Kruszelnicki, 2005; Weinberg, 2007) and Cancer Research UK have identified there are more than 200 different types of cancer (Cancer Research UK, 2008; Nery, 1986) and about 100 cancer genes have been found, but many more are thought to be undiscovered (Newton, 2000).

Most cancers are named for the organ or type of cell in which they start (Clarke & Weissman, 2008). Cancer arises from a loss of normal growth control (Giacca & Erler, 2008). In normal tissues, the rates of new cell growth and old cell death are kept in balance (Smith & Martin, 1973); in cancer, this balance is disrupted (Barthel, 2005). This disruption can result from uncontrolled cell growth or loss of a cell’s ability to undergo apoptosis: apoptosis, or cell suicide is the mechanism by which old or damaged cells normally self-destruct (NCI, 2009a).

Approximately 85% of cancers occur in epithelial cells and are classified as carcinomas (Clarke & Weissman, 2008). Cancers derived from mesoderm (bone or muscle cells) are called sarcomas and cancers of glandular tissues are called adenocarcinomas (Pecorino, 2005). Several lines of evidence indicate that tumourigenesis or carcinogenesis, is a multistep process and that these steps reflect genetic alterations that drive the progressive transformation of normal human cells into highly malignant derivatives (Bishop & Weinberg, 1996).

Cancer, by definition, is a disease of the genes (Jubb, Bell, & Quirke, 2001), in which normal cells become carcinogenic by mutation of DNA material. These oncogenes are part of a family called ras oncogenes or ras genes: as messengers, they attach to a cell’s membrane and alter the cell through the cell receptors. The damaged or misplaced genes are called proto-oncogenes and carry potential oncogenic risk (Yance & Valentine, 1999).
In the simplest sense cancer arises from several factors: stimulation of growth factors, gene mutation, and suppression of natural tumour inhibitors (Jussila & Alitalo, 2002). Exogenous and endogenous substances from natural hormones, synthetic chemicals and radiation, all play a role in tumourigenesis (Jiang, Martin, Llaffán, & Mansel, 2000). Two important but related concepts of cancers arising from stem cells or germ cells are the hypothesis that (a) tumours originate in either tissue stem cells or their immediate progeny through dysregulation of the normally tightly regulated process of self-renewal. And as a result of this, (b) tumours contain a cellular subcomponent that retains key stem cell properties, which include self-renewal, which drives tumourigenesis, and differentiation, albeit aberrant that contributes to cellular heterogeneity (Wicha, Liu, & Dontu, 2006).

For many years, discoveries about the genetic determinants of cancer appeared to be having only minor effects on efforts to control the disease in the clinic but following advances made over the past decade, however, the description of cancer in molecular terms seems increasingly likely to improve the ways in which human cancers are detected, classified, monitored, and treated (Varmus, 2006).

There are six hallmarks of cancer, which are essential for carcinogenesis (Caliguri, 2007). Cancer must incorporate all six of these characteristics without all of which it is likely cancer will not exist (Adams, 2000; Hanahan & Weinberg, 2000, Pecorino, 2005; see also American Association for Cancer Research [AACR], 2009).

1. Cell cycle / Growth signal autonomy; defined as cancer cells being independent of normal growth factor signalling, while evasion of growth factor inhibitory signals means cancer cells have acquired mutations, which interfere with inhibitory pathways (Hartwell & Kastan, 1994; Rowinsky, 2003). Signalling pathways that mediate the normal functions of growth factors are commonly subverted in cancer (Aaronson, 1991).

2. Evasion of growth inhibitory signals (Chouaib, Asselin-Paturel, Mami-Chouaib, Caignard, & Blay, 1997).

3. Evasion of apoptosis; arises when cancer cells lose apoptosis regulators such as p53 gene (Evan & Vousden, 2001).

4. Unlimited replicative potential; unregulated replicative potential is “the altered regulation of telomere maintenance resulting in unlimited replication potential” (Dahse, Fiedler, & Ernst, 1997, p. 712).
5. Angiogenesis; the formation of new blood vessels is critical for the development of a tumour. A tumour cannot grow larger than 1 million cells before it needs its own blood supply. Tumours are able to induce angiogenesis (Gupta & Qin, 2003).

6. Invasion and metastasis; Cancer cells are able to migrate by dissolving the basement membrane and spread though the blood or lymphatic systems (Liotta & Kohn, 2003).

There are essential alterations in cell physiology that collectively dictate malignant growth: self-sufficiency in growth signals, insensitivity to growth-inhibitory (antigrowth) signals, evasion of programmed cell death (apoptosis), limitless replicative potential, sustained angiogenesis, tissue invasion and metastasis and immune evasion (Hanahan & Weinberg, 2000).

Each of these physiologic changes, which are novel capabilities acquired during tumour development, represents the successful breaching of an anticancer defence mechanism hardwired into cells and tissues (Esteller, 2005). It is proposed that these six capabilities are shared in common by most and perhaps all types of human tumours (Adams & Jasani, 2000).

Three factors contribute to overall net cell numbers (Pecorino 2005):

1. Cell proliferation (cell division and cell growth)
2. The elimination of programmed cell death (apoptosis)
3. Lack of differentiation (inactive phase of cell growth)

The cell cycle is regulated by a series of signalling events consisting of positive and negative regulators, which control cell reproduction and cell death (Hartwell & Kastan, 1994). There are two types of genes involved in cancer, oncogenes and tumour-suppressor genes (Newton, 2000). Normal cell genes (proto-oncogenes) are turned into oncogenes by both endogenous factors (diet, obesity, exercise), and exogenous factors (radiation, pollution) (Pollner, 1993). Tumour-suppressor genes are inactivated in similar fashion (Bostwick et al., 2004).

There are hundreds of cancer types but they share common traits: they divide relentlessly, they avoid cell death and growth inhibitory signals, they induce angiogenesis, they repair/reconstruct their telomeres and they metastasise (Panigrahi & Mai, 2005). The process of tumourigenesis is complex involving DNA damage (Braig & Schmitt, 2006), the capacity to shut off the tumour suppressor genes i.e. p53 and pRb gene (Cohen et al., 2007) and sustain telomere
integrity (Flanary, 2005).

Mutations of DNA/RNA are due to changes in genes (Wright, Hastie, & Weatherall, 2007). Proto-oncogenes (precursors of oncogenes or cancer genes) normally regulate cells as they multiply during growth of a foetus or to replace cells that are lost in adults due to tissue damage or tissue repair (Minkoff & Baker, 2000). The process of activation of proto-oncogenes to oncogenes can include viral and retroviral transduction or integration and/or point mutations, all of which occur when viral DNA is inserted into host DNA/RNA (Bishop, 1989; King, 2009). Gene amplification (chromosome instability), chromosomal translocation and/or protein-protein interactions affect cell growth and replication by induced oncogenic activity (King, 2008; Lucibello & Muller, 1992).

They are balanced by tumour suppressor genes, which provide a means to control the multiplication of the cells so that they conform to the normal architecture of tissues and organs (Kodama, Murakami, & Kodama, 1998). The coordination of both proto-oncogene growth and tumour suppressor gene activation (apoptosis) is extremely important for the cells to navigate through the growth and development of a child or for the repair of damaged tissues (Pelen-garis & Khan, 2006).

Stem cells are immature, undifferentiated source cells, which mature as they divide and eventually reach a fully differentiated or mature cell, which cannot divide (Wobus & Boheler, 2005). The cancer phenotype is caused by an inability of a stem cell to differentiate fully under the local environmental conditions (Clarke & Becker, 2006; Gil, Stembalska, Pesz, & Sasiadek, 2008). Because the cancer cell cannot differentiate, it never loses its potential for growth (Reya, Morrison, Clarke, & Weissman, 2001). The block in differentiation of cancer cells is caused by a relative lack of radical scavengers, particularly manganese superoxide dismutase, coupled with production of radicals, especially superoxide. The high reactivity of these radicals leads to changes in key sub-cellular structures and prevents the cell from attaining the organisation needed for cell differentiation to occur (Oberley, Oberley Buettner, 1980).

Another factor in malignancies is chronic inflammation (Macarthur, Hold, & El-Omar, 2004). Inflammation functions at all three stages of tumour development: initiation, progression and metastasis (Dalgliesh & O’Byrne, 2006). Inflammation contributes to initiation by inducing the release of a variety of cytokines and chemokines that alert the vasculature to release inflammatory cells and factors into the tissue milieu, thereby causing oxidative damage, DNA mutations, and other changes in the microenvironment, making it more conducive to cell transformation, increased survival and proliferation (NCI, 2009a).
ORTHODOX MEDICAL ISSUES IN ONCOLOGY

Other theories of cancer exist and aneuploidy has support. Aneuploidy is the condition in which a cell has extra or missing chromosomes, and is often associated with tumours. But whether it is a cause or a consequence of cancer remains a vexed question (Pellman, 2007). An aneuploid is an individual organism whose chromosome number differs from the wild type by part of a chromosome set. Generally, the aneuploid chromosome set differs from wild type by only one or a small number of chromosomes. Aneuploids can have a chromosome number either greater or smaller than that of the wild type (Griffiths, Miller, Suzuki, Lewontin, & Gelbart, 1996). The aneuploidy hypothesis predicts the long latent periods and the clonality on the basis of the following two-stage mechanism: stage one, a carcinogen (or mutant gene) generates aneuploidy; stage two, aneuploidy destabilises the karyotype and thus initiates an autocatalytic karyotype evolution generating preneoplastic and eventually neoplastic karyotypes (Li, Sonik, Reinhard, Rasnick, & Duesberg, 2000).

The many complex phenotypes of cancer have all been attributed to gene mutation; however, it has yet to be determined whether this mutation is aneuploidy (the somatic mutation that makes cancer a species of its own) or gene mutation (Duesberg & Rasnick, 2000). Much focus in cancer literature is placed on single-oncogene studies or microarray studies that focus on oncogene and tumour suppressor expression patterns (Duesberg & Rasnick, 2000). Over 100 years ago aneuploidy was proposed to cause cancer, however the aneuploidy hypothesis has since been abandoned, in favour of the gene mutation hypothesis, because it could not offer conventional explanations for cancer-specific phenotypes (Duesberg et al., 1999).

Today, however, the theory of aneuploidy is sufficient to explain genetic instability and the resulting karyotypic and phenotypic heterogeneity of cancer cells, independent of gene mutation (Duesberg, Rausch, Rasnick, & Hehlmann, 1998). The theory is there are no cancer-specific gene mutations. Even tumours of a single organ rarely have uniform genetic alterations. And, in a rebuttal that should be decisive, no genes have yet been isolated from cancers that can transform normal human or animal cells into cancer cells (Zhang et al., 1997).

Furthermore, the latent periods between the application of a carcinogen and the appearance of cancer are exceedingly long, ranging from many months to decades. In contrast, the effects of mutation are instantaneous (Tomlinson & Bodmer, 1999). Evidence such as tumour specific aneuploidy, presence of
aneuploidy in various preneoplastic conditions, increased frequency of genetic instability in aneuploid cell lines compared with diploid cells, and mutation of mitotic checkpoint genes suggests that aneuploidy possibly plays an active role in carcinogenesis (Dey, 2004, p. 245).

Another more radical theory involves multigenesis as opposed to metastasis. Traditionally multi-site cancer has been attributed to metastasis – a process in which a cancer cell migrates through the vascular system from a primary site to a secondary site (Liu et al., 2008). However, an alternative mechanism is multigenesis – in which different cells independently become cancer cells and thus form multiple tumours in different parts of the body (Liu et al., 2008). The formation of multi-site cancers (MSCs) has conventionally been regarded as a result of haematogenous metastasis. However, some MSCs may appear as unusual in the sense of vascular dissemination pattern and therefore be explained by alternative metastasis models or even by non-metastatic independent formation mechanisms.

Two alternative mechanisms for the independent formation of MSCs:

1. Formation of separate tumours from cancer-initiating cells (CICs) mutated at an early stage of development and then diverging as to their physical locations upon further development;

2. Formation of separate tumours from different CICs that contain mutations in some convergent ways.

Either of these processes does not require long-distance migration and/or vascular dissemination of cancer cells from a primary site to a secondary site. Thus, we classify the formation of these MSCs from indigenous CICs (iCICs) into a new mechanistic category of tumour formation – multigenesis (Zhang et al., 2008).
<table>
<thead>
<tr>
<th>Therapy</th>
<th>Site</th>
<th>Stage</th>
<th>5-year Disease-Free Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery (single modality)</td>
<td>Cervix</td>
<td>I</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Bladder</td>
<td>0+A</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B1</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Colon</td>
<td>A</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Prostate</td>
<td>I &amp; II</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Larynx</td>
<td>I &amp; II</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Endometrium</td>
<td>I</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Ovary</td>
<td>I &amp; II</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Oral Cavity</td>
<td>I &amp; II</td>
<td>67-76</td>
</tr>
<tr>
<td></td>
<td>Kidney</td>
<td>I &amp; II</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Testis (nonseminomatous)</td>
<td>I</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Lung (non-small cell)</td>
<td>I</td>
<td>50-70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II</td>
<td>37</td>
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</table>
### Table 2
*Cancer Statistics: Five-Year Disease-Free Survival Rates According To Cancer Therapy*

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Site</th>
<th>Stage</th>
<th>5-year Disease-Free Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation Therapy (single modality)</td>
<td>Non-Hodgkin lymphoma</td>
<td>Pathologic stage 1</td>
<td>60</td>
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<tr>
<td></td>
<td>Hodgkin lymphoma</td>
<td>Pathologic stage 1A</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Testis (seminoma)</td>
<td>II &amp; III</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Prostate</td>
<td>I &amp; II</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Larynx</td>
<td>I &amp; II</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Cervix</td>
<td>II &amp; III</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Nasopharynx</td>
<td>I, II, III</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Nasal sinuses</td>
<td>I, II, III</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Oesophagus</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Lung</td>
<td>III MO (excluding Pancoat’s tumour)</td>
<td>9</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>Choriocarcinoma (women)</td>
<td>All stages</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Testis (nonseminomatous)</td>
<td>III</td>
<td>88</td>
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| **Table 2**  
Cancer Statistics: Five-Year Disease-Free Survival Rates According To Cancer Therapy |
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Therapy</strong></td>
<td><strong>Site</strong></td>
<td><strong>Stage</strong></td>
</tr>
<tr>
<td>Hodgkin lymphoma</td>
<td>IIB &amp; IVA &amp; B</td>
<td></td>
</tr>
<tr>
<td>Diffuse large cell lymphoma</td>
<td>II, III, III</td>
<td></td>
</tr>
<tr>
<td>Burkitt’s lymphoma</td>
<td>I, II, III</td>
<td></td>
</tr>
<tr>
<td>Leukaemia (childhood ALL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukaemia (childhood ANLL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukaemia (&lt; 40yr, ANLL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukaemia (&gt; 40yr, ANLL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung (small cell)</td>
<td>Limited</td>
<td></td>
</tr>
<tr>
<td>Surgery and Radiation</td>
<td>Testis (seminoma)</td>
<td>I</td>
</tr>
<tr>
<td>Endometrium</td>
<td>II</td>
<td>62</td>
</tr>
<tr>
<td>Bladder</td>
<td>B2 &amp; C</td>
<td>54</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>III</td>
<td>36</td>
</tr>
<tr>
<td>Hypopharynx</td>
<td>II &amp; III</td>
<td>33</td>
</tr>
<tr>
<td>Lung</td>
<td>III-MO Pancoast</td>
<td>32</td>
</tr>
</tbody>
</table>
### Table 2

*Cancer Statistics: Five-Year Disease-Free Survival Rates According To Cancer Therapy*

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Site</th>
<th>Stage</th>
<th>5-year Disease-Free Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery and Chemotherapy</td>
<td>Colon</td>
<td>III</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Ovary: carcinoma</td>
<td>III, IV</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>CNS (medulloblastoma)</td>
<td></td>
<td>70-80</td>
</tr>
<tr>
<td></td>
<td>Ewing’s sarcoma</td>
<td>All stages</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Anal cancer (squamous cell carcinoma)</td>
<td>III &amp; IV</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Lung (small cell cancer)</td>
<td>Limited</td>
<td>25</td>
</tr>
<tr>
<td>Surgery, Radiation and Chemotherapy</td>
<td>Breast (with radiation therapy and +/- hormonal therapy)</td>
<td>I &amp; II</td>
<td>70-90</td>
</tr>
<tr>
<td></td>
<td>Kidney (Wilms’ tumour)</td>
<td>All stages</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Embryonal rhabdomyosarcoma</td>
<td>All stages</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Oral cavity, hypopharynx</td>
<td>III &amp; IV</td>
<td>20-40</td>
</tr>
<tr>
<td></td>
<td>Rectum</td>
<td>II &amp; III</td>
<td>50-70</td>
</tr>
</tbody>
</table>

*Source: ACS, 2008b; Beers et al., 2006, pp. 1147-1171; Surveillance Epidemiology and End Results (SEER), 2008a; SEER, 2008b.*
Trends in the major causes of death indicate that while mortality for cardiovascular and ischemic heart diseases is decreasing, mortality for cancer is still increasing or declining slightly (Smith, 1996). In a more recent study from the Journal of the National Cancer Institute it was found there is a decline in both the incidence and the death rates from all cancers combined in both men and women. These declines occurred in most racial and ethnic groups and partly reflect decreases in the three most common cancers in men (lung, colorectum, and prostate) and two of the three most common cancers in women (breast and colorectum), as well as the levelling off of lung cancer death rates in women (Jemal et al., 2008). The discrepancy between cancer morbidity and other morbidity rates, however, remains. This is indicated by World Health Organisation statistics, which show in Australia a decline in adult death rate from 96 deaths per 1,000 in 1990 to 65 deaths in 2006 (15 to 60 years of age). Cancer death rates were 127 per 1,000 in 2002, which is a 0.6% decline since 2002 (WHO, 2008b). Cancer in all sites in the US declined by 1.7% between 1992 and 2001 (NCI, 2009b).

Clearly cancer mortality rates are not following the trend of other disease mortality rates. It was estimated that there were 10.9 million new cases, 6.7 million deaths, and 24.6 million persons living with cancer (within 5 years of diagnosis) in the year 2002 in the world (Parkin, Bray, Ferlay, & Pisani, 2005).

Table 3
Global Cancer Statistics, 2002

<table>
<thead>
<tr>
<th>INCIDENCE</th>
<th>MORTALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Cases</td>
<td>Cases</td>
</tr>
<tr>
<td>Lung</td>
<td>965,241</td>
</tr>
<tr>
<td>Breast</td>
<td>1,151,298</td>
</tr>
<tr>
<td>Prostate</td>
<td>679,023</td>
</tr>
<tr>
<td>Colon / rectum</td>
<td>550,465</td>
</tr>
<tr>
<td>All sites but skin</td>
<td>5,801,839</td>
</tr>
</tbody>
</table>

Source: Parkin, Bray, Ferlay, & Pisani, 2005.

Estimates below were produced by applying age-specific cancer rates of a defined geographic region (worldwide, developed, and developing countries) from the GLOBOCAN 2002 database (http://www-dep.iarc.fr/globocan/
database.htm) to the corresponding age-specific population for the year 2007 from the United Nations population projections. Cancer incidence in 2007 was 12,392,279.

Table 4
Global Cancer Facts & Figures 2007

<table>
<thead>
<tr>
<th>Estimated New Cases</th>
<th>Estimated Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Lung</td>
<td>1,108,731</td>
</tr>
<tr>
<td>Prostate</td>
<td>782,647</td>
</tr>
<tr>
<td>Breast</td>
<td></td>
</tr>
<tr>
<td>Colo-rectal</td>
<td>630,358</td>
</tr>
<tr>
<td>All sites but skin</td>
<td>6,615,004</td>
</tr>
</tbody>
</table>

Source: Garcia et al., 2007.

Incidence is the number of new cases arising in a given period in a specified population. Cancer registries collect this information routinely and it can be expressed as an absolute number of cases per year or as a rate per 100,000 persons per year. The latter provides an approximation to the average risk of developing a cancer. Mortality is the number of deaths occurring in a given period in a specified population. It can be expressed as an absolute number of deaths per year or as a rate per 100,000 persons per year (ACS, 2008b). In 1999, the United Nations estimated that the world’s population was growing at the rate of 1.14% (or about 75 million people) per year (United States Census Bureau, 2008; United Nations, 1999). Even given population increases over the five years, both incidence and mortality has increased in a statistically significant manner of 14% and 13% respectively.

INTEGRATIVE CANCER DEFINITIONS

Traditional Chinese Medicine (TCM)

Traditional Chinese medicine (TCM) is a complete knowledge system, which researches into human health conditions via a different approach compared to orthodox medicine (Zhou et al., 2004). Disease causes in TCM are culturally defined and are a reflection of their societal values (Unschuld, 1986). Maciocia, in Diagnosis in Chinese Medicine (2004, p. xliii), states “there is no such thing as a ‘right’ translation of a Chinese medical term”, but an attempt can
be made to maintain consistency in terminology. Wiseman and Ye (1998, p. 4) state “Owing to the current lack of standardisation of Chinese medical in English, terms are difficult to access”.

Below is a chart, which indicates the various causes of cancer from a TCM point of view. The following discussion of the perceived causes of disease according to TCM takes the chapter; “The origin and development of oncology theory in Traditional Chinese Medicine” by Li, Cheng, & Du (2003) as a starting point, but with additional explication by this writer.

**Table 5**

*Historical understanding in Chinese medicine*

<table>
<thead>
<tr>
<th>Historical understanding</th>
<th>Contemporary interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former heaven natural endowment</td>
<td>The traditional Chinese understanding of genetics, the ‘essence’ one receives from ones parents</td>
</tr>
<tr>
<td>Internal damage by the seven affects</td>
<td>Unregulated emotional expression and a lack of stability that can lead to insomnia, unreflective behaviour (compulsion), including drug use and affect distress. This includes depression, anxiety, phobias and OCD (obsessive compulsive disorder)</td>
</tr>
<tr>
<td>Unregulated diet</td>
<td>Inappropriate foods, overeating, poor diet and nutrition and it includes spoiled, rancid foods</td>
</tr>
<tr>
<td>Unregulated stirring and stillness</td>
<td>Stress and subsequent elevated cortisol, epinephrine and norepinephrine as well as allostatic overload</td>
</tr>
<tr>
<td>Ageing</td>
<td>Immune system, gastrointestinal, organ system and CNS decline as well as the shortening of telomeres</td>
</tr>
<tr>
<td>Poisoning</td>
<td>Toxins, preservative, dyes, pesticides, xenestrogens, radiation, drugs both recreational and pharmacological, and other environmental pollutants</td>
</tr>
<tr>
<td>Unclean sexual activities</td>
<td>STDs, excessive and compulsive sexual activity</td>
</tr>
<tr>
<td>Contraction of external evils</td>
<td>Virus, bacteria and/or fungal infections</td>
</tr>
</tbody>
</table>

Source: Li, et al. (2003) with interpretation by the author.
The transliteration of Chinese terms is not standardised to Western scientific terminology and there is difficulty in comparing the empirical observations of traditional medicine to objective scientific language (Flaws, 1999). In the field of Chinese medicine, the issue of term standardisation for English language Chinese medical publications constitutes a matter of intense debate (Hui & Pritzker, 2007). Maciocia, in a letter to the journal Clinical Acupuncture and Oriental Medicine, commented “the most important issue facing practitioners is not how to transmit the language of Chinese medicine (an impossible task given the differences between Chinese and other languages) but how to transmit the clinical skills of Chinese medicine” (Maciocia, 2007, p. 2).

There was no scientific nomenclature in China until 1850, when a medical missionary in Macao named Benjamin Hobson published huai yiguan nianji (Chang, n.d). Zhou et al. (2008) have begun a database of traditional Chinese nomenclature to build a bridge to TCM clinical practice.

**Chinese Patterns and Oncology**  
(see Patterns below, p. 42 also TCM Glossary p. 182).

The *Ling Shu or The Spiritual Pivot*, the second book of Huang Di Nei Jing (*The Yellow Emperor’s Inner Classic*), supposedly written by Huang Di in 2600 BCE (Wu, 2002), describes the cancer mechanism in the following manner. Qi Bo, the Emperor’s minister, replies to the Emperor’s question on tumours saying “a man’s channels of blood (vessels) nourish and protect; they circulate and flow without stop” (Wu, p. 276). They resonate below the numerous rivers (superficial meridians) meaning it is not an external disease (exogenous in origin). When cold evil (hypofunction of organ system and deficiency of yang) is present, due to deficiency of spleen qi (transformative and nutritive capacities of GI tract) in the middle of the major channels, it causes blood to coagulate. The blood settles thus there is an obstruction (Kaptchuk, 2000). An obstruction causes protective qi (immunity) to reverse, so it cannot oppose the cold evil therefore swellings arise (Beinfield, Korngold, & Micozzi, 2007). When qi is constrained and blood is static it transforms into heat toxin (elevated inflammatory cytokines) (Wu, 2002).

Therefore, according to the early Chinese writings on the subject, most cancers develop in a cold, damp environment (deficient of yang and qi) but are also species of localised heat toxin (Beinfield et al., 2007).

This includes:
*Qi Depression* (systemic inability to adapt, absence of vital energy). With or without Phlegm binding (lymphatic congestion, poor circulation of fluids):
When qi is stagnant it is called qi depression (Wiseman & Ellis, 1985). Qi stagnation can occur for a number of reasons, however in this circumstance we identify qi vacuity (qi xu) as the factor (Wiseman & Ellis, 1985). When qi fails to move fluids congeal and phlegm fluid retention is a general term for all congealed water metabolism in the human body (Clavey, 2003). This is mainly an indication of retained water that is not directly related to altered Spleen function (Unschuld, 2000). The causative factor of scrofula (nodules as thickened, rubbery-feeling lymph nodes) is the accumulation of Phlegm Fluids, because this is a disease mainly secondary to stagnation of Liver Qi (see qi depression, qi stagnation), which further disturbs water metabolism (Flaws, 2008).

**Cold and Phlegm Congealation and Stagnation:** When body fluids accumulate due to qi xu they stagnate and stagnation has a tendency to create heat (inflammatory markers). This is an example of deficiency, xu transforming into excess, shi (Maciocia, 1994).

**Wind Heat with Blood vacuity (xu) Dryness:** Wind is a term for exogenous pathogens; be it viral, bacterial or environmental toxin. Blood dryness is associated with a number of conditions including skin, lung and intestines. Since blood is yin and nourishing, dryness would inhibit these factors (Maciocia, 1994).

**Liver - Kidney vacuity:** A deficiency of these key yin organs creates systemic depletion and a rising of yin xu heat. In a discussion on accumulations Li, P., Cheng, & Du. (2003) reported “Accumulations do not affect robust persons, only those suffering from Deficiency” (p. 26).

**Qi and blood Xu:** qi and blood are the fundamental nourishing qualities; qi creates and moves blood, blood nourishes qi (Maciocia, 1994).

**Toxic Heat:** In chronic, interior conditions this develops from fire and involves swellings. Fire is drying and depletes yin, damages blood and yin and causes bleeding/blood stasis (Flaws & Finney, 1996).

**Qi and Essence (jing) collapse:** The Golden Mirror of Medical Collections written by Wu Qian in 1742, and which to this day remains an important reference book, states “The pre heaven [genetic] essence originates from the parents, the post heaven [epigenetic] essence originates from food” (Hanson, 2003). The collapse of such critical qualities indicates a severe and likely fatal condition. In another interpretation of disease states, Li Dong-yuan’s theory of yin fire explored in his 13th century book the Pi Wei Lun looks at the mechanisms of complex pathology arising from deficiency. His investigation into disease
mechanisms involves the concept of yin fire (Li, 12th century CE/1993). Yin fire refers to an evil heat, often damp in nature, which develops from the lower burner but which then counter-flows upward (Flaws, n.d). It involves:

1. Spleen qi vacuity
2. Damp heat
3. Liver depression, depressive heat
4. Yin & blood vacuity
5. Stirring of ministerial fire

According to Sun (2002), cancer always involves a species of toxins. These cancer toxins are typically produced due to the depressive heat associated with Yin Fire. Long-term improper diet and physical fatigue will cause abnormal structure and function of mitochondrion and lead to Adenosine triphosphate (ATP) dispoiesis, which will manifest as Spleen deficiency (Ruan, 2003). The energy will be released in the form of heat quantity (yin vacuity heat), and produce the condition of downward flow of Spleen qi, upward ascending of Yin Fire, and it will manifest as weak limbs, high body temperature, work intolerance. This is the essence of Yin Fire in modern medicine (Ruan, 2003).

According to TCM, yin vacuity [xu] (organ/organ system structural decline) may reflect a status of long-term malnutrition, which usually occurs in patients with chronic exhausted disease, especially late stage cancer (Lin, Chen, Li, Hsieh, & Liu, 2008). Ho, Guo, Chen, & Peng (2003) found that nutritional status is associated with the survival of terminally ill cancer patients. Yin vacuity related symptoms might occur in cancer patients under natural disease process or after medical interventions such as operation, chemotherapy or radiotherapy (Zhang et al., 2006).

In Traditional Chinese Medicine, the organs are not exactly equivalent to the anatomical structures defined in Western medicine. The use of those Western terms is based on the similarity between the Western concept of how that organ functions and the physiological processes described in the Chinese medical texts. In classical Chinese medicine, detailed knowledge of the dynamics and interrelationship of the five organ networks is considered fundamental and this system of knowledge describes the body as a dynamic system of intertwined functional circuits that reflect and resonate with the macrocosm of the universe (Dharmananda, n.d.; Zhang, 1995/ c.1918).

Unfortunately, the traditional view of the organs is made difficult to understand by the fact that organs known to modern medicine have been directly linked, by naming, to those of traditional medicine, as follows: gan: Liver, fei:
Lung, pi: Spleen, xin: Heart, and shen: Kidney. As a result of this linkage, the gan rectifying system, traditionally defined by its function of regulating the upward and outward expansion of qi and blood, is now labelled with the same term, liver, as the anatomical organ that is known, almost exclusively, for its metabolism of biochemicals. In Chinese, both the traditional organ network and the anatomical organ are called gan, and in English, both are called liver (Deng & Zhou, 1987, p. 278).
**Table 6**
*TCM organ patterns associated with cancer*

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Symptoms</th>
</tr>
</thead>
</table>
| **yin vacuity (xu)** | False heat symptoms, which may be worse in the afternoon or evening, include thirst, rapid pulse, facial flush, warm palms, warm feet, warm chest, scanty-dark urine, lack of tongue coat, irritability, and night sweats. Emaciation.  
Factors: psychological stress, worry and/or alcohol  
Dryness symptoms such as dry mouth, dry stools, and dry skin can include concurrent Blood xu.  
Tongue: red with little or no coat. |
| Stomach yin vacuity | General yin vacuity symptoms, plus lack of appetite, stomach pain, and feeling of hunger after eating.                           |
| Liver yin vacuity   | General yin vacuity symptoms, plus dry eyes, dream-disturbed sleep, insomnia, scanty menstruation, numbness in the extremities, and sallow complexion. |
| Kidney yin vacuity  | General yin vacuity symptoms, plus vertigo, dizziness, tinnitus, deafness, poor memory, low back pain, nocturnal emissions, and pain in the bones (especially the knees). |
| Lung yin vacuity    | General yin vacuity symptoms, plus unproductive cough, dry cough, dry sticky sputum, and blood-tinged sputum.                    |
| **yang vacuity**    | Cold symptoms, including cold limbs, aversion to cold, body aches, body stiffness, lack of thirst, bright-white complexion, white tongue coat, slow pulse, and a pale, swollen, and moist tongue body.  
Low energy, loose stools.  
<p>| Kidney yang vacuity | General yang vacuity symptoms, plus sore lower back, oedema, weak knees, impotence, premature ejaculation, and clear urination. |</p>
<table>
<thead>
<tr>
<th>Pattern</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney yang vacuity</td>
<td>General <em>yang vacuity</em> symptoms, plus sore lower back, oedema, weak knees, impotence, premature ejaculation, and clear urination.</td>
</tr>
<tr>
<td>Spleen yang vacuity</td>
<td>General <em>yang vacuity</em> symptoms, plus lack of appetite, abdominal distension after eating, undigested food in stools and weakness in the extremities.</td>
</tr>
<tr>
<td>Stomach yang vacuity</td>
<td>General <em>yang vacuity</em> symptoms, plus discomfort in the stomach that is improved after eating warm foods, lack of appetite, and desire for warm foods and liquids.</td>
</tr>
<tr>
<td>Liver yang repletion</td>
<td>Anger or irritability, dizziness, tinnitus, deafness, insomnia, dream-disturbed sleep, scanty menstruation, numbness in the extremities, sallow complexion, dry eyes, red tongue body, and also headache on the temples, eyes, or sides of the head.</td>
</tr>
<tr>
<td>Upward rising heat</td>
<td><em>Upward rising heat</em> is usually due to the <em>heat of liver yang repletion</em>, <em>stomach heat</em>, or any type of <em>yin vacuity</em>. The symptoms are <em>heat</em> in the upper portion of the body, such as a red face or neck, headache, red tongue body, dry throat, and thirst.</td>
</tr>
<tr>
<td>Stomach fire</td>
<td>Burning sensation and pain in the stomach, thirst for cold liquids, strong hunger, bleeding gums, sour regurgitation, constipation, nausea, bad breath, rapid pulse, red tongue body, and a thick, yellow and dry tongue coat. If phlegm is involved, there may be less thirst, fullness in the stomach, mucus in the stools, bloating and mental derangement.</td>
</tr>
<tr>
<td>Qi vacuity (general symptoms)</td>
<td>Weak voice, spontaneous sweating, lack of appetite, loose stools, fatigue, shortness of breath, sweating with little/no exertion, facial pallor, and a pale, swollen tongue. Factors: poor diet, over work, stress.</td>
</tr>
<tr>
<td>Lung qi vacuity</td>
<td>General <em>qi vacuity</em> symptoms, plus cough, and a tendency to catch colds frequently.</td>
</tr>
<tr>
<td>Pattern</td>
<td>Symptoms</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Kidney qi vacuity</td>
<td>General <em>qi vacuity</em> symptoms, plus soreness of the lower back, clear and frequent urination, dribbling after urination, incontinence, night time urination, nocturnal emissions not associated with dreams, premature ejaculation, spermatorrhoea, chronic vaginal discharge, asthma, and cold limbs.</td>
</tr>
<tr>
<td>Heart qi vacuity</td>
<td>General <em>qi vacuity</em> symptoms, plus palpitations and fearfulness.</td>
</tr>
<tr>
<td>Spleen qi vacuity</td>
<td>General <em>qi vacuity</em> symptoms, plus abdominal distension after eating, soft stools and weak extremities. Similar to Spleen yang xu.</td>
</tr>
<tr>
<td>Qi stagnation (general symptoms)</td>
<td>Feeling of distension, distended pain often altering location, mental depression, irritability, mood swings, and sighing.</td>
</tr>
<tr>
<td>Liver qi stagnation</td>
<td>General <em>qi stagnation</em> symptoms, plus hiccups, irregular periods, painful periods, premenstrual tension, and premenstrual breast distension; if liver <em>qi invades the stomach</em>, then also nausea, vomiting, lack of appetite, sour regurgitation, diarrhoea, and abdominal distension.</td>
</tr>
<tr>
<td>Blood vacuity</td>
<td>Dizziness, sallow or pale complexion, poor memory, numbness in the extremities, blurred vision, insomnia, scanty menstrual periods, depression, dry skin, itchy skin, dry hair, and a pale tongue. Factors: excessive menstruation, blood loss due to internal medical issues, spleen deficiency, emotional strain.</td>
</tr>
<tr>
<td>Blood stagnation</td>
<td>Purple lips and tongue, sharp, boring, or fixed, stabbing pain, fixed masses, clotted menstrual blood, dark coloured menstrual blood, and purple nails.</td>
</tr>
</tbody>
</table>
Table 6  
**TCM organ patterns associated with cancer**

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood heat</strong></td>
<td>Feelings of heat, red eruptions on the skin, dry mouth, red tongue, and rapid pulse. Also excessive menstrual bleeding, epistaxis, bleeding gums, or other forms of bleeding.</td>
</tr>
<tr>
<td><strong>Phlegm accumulation</strong></td>
<td>Sticky and greasy tongue coating, sputum, lumps under the skin, masses, numbness in the extremities, mental disease, gallstones or kidney stones, and arthritic bone deformities.</td>
</tr>
<tr>
<td><em>Phlegm accumulation in the lungs</em></td>
<td>General <em>phlegm accumulation</em> symptoms, plus cough, chest congestion, and sinus congestion.</td>
</tr>
<tr>
<td><strong>Damp heat</strong></td>
<td>Infection, yellow discharge, fever, thirst without desire to drink, feeling of heaviness in the body, scanty urine, fast pulse, red tongue with a yellow and moist coat.</td>
</tr>
<tr>
<td><em>Damp heat in the lungs</em></td>
<td>General <em>damp heat</em> symptoms, plus cough, yellow sputum, shortness of breath, asthma, and stuffy chest.</td>
</tr>
<tr>
<td><strong>Lung damp heat</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Large intestine damp heat</strong></td>
<td>General <em>damp heat</em> symptoms, plus abdominal pain, diarrhoea, burning in the anus, and mucus and blood in the stool.</td>
</tr>
<tr>
<td><strong>Liver damp heat</strong></td>
<td>General <em>damp heat</em> symptoms, plus fullness and pain in the chest and abdomen, jaundice, bitter taste in the mouth, nausea, vomiting, loss of appetite, distension of the abdomen, vaginal discharge, and pain and swelling in the scrotum.</td>
</tr>
<tr>
<td><strong>Toxins</strong></td>
<td>Green discharge from lesions, tissue decay, stench of tissue or discharge, fever, and fast pulse.</td>
</tr>
<tr>
<td><em>Toxins in the large intestine</em></td>
<td>General <em>Toxin</em> symptoms plus symptoms of <em>large intestine damp heat</em>.</td>
</tr>
</tbody>
</table>

*Source: Boik, 1995; Dharmananda, 1999; Flaws, 1997; Kun, 1985; Maciocia, 1994; Shi & Shi, 1992; Sun, 1991; Unschuld, 1998.*
The *yin/yang* theory is an ancient Chinese philosophy that underlies the practice of traditional Chinese medicine. Ko, Mak, Chiu, and Poon did a more modern interpretation in 2004. They assert that although yang-tonic herbs tend to boost body function possibly through enhancing the mitochondrial oxidative processes, the yin property (i.e. antioxidant potential) of these herbs can also play a role in safeguarding mitochondrial ATP generation. The pharmacological basis of *yang-invigoration* by Chinese tonic herbs might be due primarily to the enhancement of mitochondrial ATP generation (Ko et al., 2004). Ou, Huang, Hampsch-Woodill, & Flanagan (2003) go on to say that in eastern society, yin/yang is regarded as an incomprehensible ideology without definite physical meaning (Ou et al., p. 127). Consequently, the yin/yang balance in medicine has not been studied by modern scientific means. They propose that yin/yang balance is antioxidation-oxidation balance with yin representing antioxidation and yang as oxidation. Their proposal is partially supported by the fact that the yin tonic traditional Chinese herbs have, on average, about six times more antioxidant activity and polyphenolic contents than the yang tonic herbs. Their hypothesis opens an avenue to systematically study the yin-yang balance and its health implications with the use of modern biochemical tools (Ou et al., 2003).

**Ayurvedic Medicine (AM) (Traditional Indian)**

For glossary see:  
http://www.dreddyclinic.com/ayurvedic/ayurvedic_glossary.htm

Also see Glossary p. 188

Ayurveda is a Sanskrit word derived from two roots: *ayur*, which means life, and *veda*, knowledge (Benjamin & Powell, 2000). Knowledge arranged systematically with logic becomes science and Ayurveda became the science of life. It has its root in ancient vedic literature and encompasses our entire life, the body, mind, and spirit (Lad, 1995).

Ayurveda Medicine (AM) is the Indian traditional system of medicine, which also deals with pharmaceutical science (Patwardhan et al., 2005). The Ayurvedic knowledge of the pharmaceutical science is scattered in Ayurvedic classical texts. *Sārangadhara Samhita*, which was written by Sārangadhara, systematically explains information of the Ayurvedic pharmaceutical science (Subhose, Srinivas, & Narayana, 2005).

AM is less developed as a modern scientific system compared with TCM (Patwardhan, 2005). Maintaining its spiritual basis, Ayurvedic theory states that all
disease begins with an imbalance or stress in the individual’s consciousness. It is said that even if an Ayurvedic doctor had complete knowledge of Ayurveda but could not reach the inner Self or soul of the patient, they would not be effective healers (Tirtha, 2007). Tirtha goes on to say, “the most extreme example of illness caused by lack of purpose is cancer. Ayurveda considers cancer as an emotionally caused disease” (Tirtha, p. 3). The treatment of cancer has been applied since the Vedic period and is mentioned in the Atharveda (Bloomfield, 1899). In the Kowshika Sutra of Atharveda there is a description of tumours and their treatment, which include Arbuda or malignant tumour, which is caused by derangement of Mamsadhatu (muscle), Medas (adipose) or Rakta (blood) (Devaraj, 1999).

Charaka and Sushruta Samhitas (400 CE), two well-known Ayurvedic classics, describe cancer as inflammatory or non-inflammatory swelling and mention them as either granthi (minor neoplasm) or the above arbuda (major neoplasm) (Balachandran & Govindarajan, 2005; Sushruta, 700BCE/1981). Ayurvedic classification of neoplasm depends on various clinical symptoms in relation to Tridoshas, which can be defined in one of three groups (Sahu & Mishra, 2003, pp. 278-279).

Group I: Diseases that can be named as clear malignancy, which includes arbuda and granthi, e.g. mamsar-buda (melanoma) and raktarbuda (leukaemia), mukharbuda (oral cancer) (Sahu & Mishra, 2003).

Group II: Diseases that can be considered as cancer, such as incurable ulcers with e.g. tridosaj gulmas (abdominal tumours like carcinomas of the stomach and liver or lymphomas) (Sahu & Mishra, 2003).

Group III: Diseases with the possibility of malignancy, e.g. Visarpa (erysipelas), asadhya kamala (incurable jaundice) and nadi vrana (sinusitis) (Prasad, 1987; Singh, 2002).

According to Sushruta of Sushruta Samhita (6th century BCE), the fundamental cause of major neoplasm is the pathogens that affect all parts of the body. He called the sixth layer of the skin as Rohini (epithelium), and pathogenic injuries to this layer in muscular tissues and blood vessels caused by lifestyle errors, unhealthy foods, poor hygiene and bad habits results in the derangement of Doshas, which leads to the manifestation of tumours (Balachandran & Govindarajan, 2005; Prasad, 1987; Sankaran, 1976; Singh, 2002).
The Five Great Elements.

Ayurveda believes that everything in this universe is made up of five great elements or building blocks. These are earth, water, fire, air, and ether (Subhaktha, 2005).

Earth represents the solid state of matter. It manifests stability, permanence, and rigidity. In the body, the parts such as bones, teeth, cells, and tissues are manifestations of the earth. Earth is considered a stable substance (Kinjavadekara, 1998).

Water characterises change and represents the liquid state. A large part of the human body is made up of water. Our blood, lymph, and other fluids move between our cells and through vessels, bringing energy, carrying away wastes, regulating temperature, bringing disease fighters, and carrying hormonal information from one area to another. Water is a substance without stability (Prathikanti, 2006).

Fire is the power to transform solids into liquids, to gas, and back again; it possesses power to transform the state of any substance. Within the body, the fire or energy binds the atoms together. It also converts food to fat (stored energy) and muscle. Fire transforms food into energy. It creates the impulses of nervous reactions, our feelings, and even the thought processes. Fire is considered a form without substance (Tierra & Frawley, 1988).

Air is the gaseous form of matter, which is mobile and dynamic. Within the body, air (oxygen) is the basis for all energy transfer reactions. It is a key element required for fire to burn. Air is existence without form (Miller & Miller, 1996).

Ether is the space in which everything happens. It is the field that is simultaneously the source of all matter and the space in which it exists. Ether is only the distances, which separate matter. The chief characteristic of ether is sound. Here sound represents the entire spectrum of vibration (Kinjavadekara, 1998; Subhaktha, 2005).

Every substance in our world is made up of these five substances. All substances can be classified according to their predominant element. For example, a mountain is predominantly made up of earth element. Mountains also contain water, fire, air, and ether. But these elements are very small compared to the earth. So, its classification is the earth (Kinjavadekara, 1998; Ram, 1999).

Ayurveda defines a human as the assemblage of the five great elements plus
the *immaterial self* (Narayana, Subhose, Bhatnagar, & Rao, 2005; Subhose et al., 2005; Subhose, Narayana, Bhatnagar, & Rao, 2006).

The structural aspect of our body is made up of five elements (*yin* in TCM), but the functional aspect of the body (*yang*) is governed by three biological humours. Ether and air together constitute *Vata*; fire and water, *Pitta*; and water and earth, *Kapha*. They govern psychobiological changes in the body and physio-pathological changes too. Vata-pitta-kapha are present in every cell, tissue and organ. In every person they differ in permutations and combinations (Kumar, 2005, p. 7).

Ayurvedic literature describes three body-control systems: the nervous system (*Vata* or air), the venous system (*Pitta* or fire), and the arterial system (*Kapha* or water), which mutually coordinate to perform the normal function of the body (Sharma, 1981). Ayurveda explains that a malignant abnormal growth, or *Tridosaja neoplasm*, is one in which all the three major bodily control systems, which should have mutual coordination for normal functioning of the body, are out of control (Singh, 2002). In this stage of cancer, abnormal growths of any part of the body by nature can be harmful, because the three major bodily systems have lost mutual coordination, and cannot prevent damage to tissues. The total breakdown of the coordination of these three bodily systems means a deadly morbid condition (Balachandran & Govindarajan, 2005; Pandey, 2002).

A cyst like bluish abnormal growth with neuralgic pain is the main symptom indicating the presence of a *Vataja* neoplasm. A reddish or yellowish vascular growth with inflammation and burning pain characterizes the *Pittaja* neoplasm. A stone-like hard abnormal growth with a little pain and itching is descriptive of a *Kaphaja* neoplasm. The *Sannipataja* or Tridosaja neoplasm manifests all the characters of Vataja, Pittaja and Kaphaja neoplasm. In the same way, a neoplasm with the name *Vata-Pittaja*, *Vata-Kaphaja*, or *Pitta-Kaphaja* will have a mixture of symptoms (Mana, 1987).

*Panchakarma* is Ayurveda’s principal cleansing and detoxification treatment used in cancer. Panchakarma means the *five therapies*. The five therapeutic means of eliminating toxins from the body are *Vamana*, *Virechana*, *Nasya*, *Basti* and *Rak-tamokshana*. This series of five therapies helps remove deep-rooted stress and illness causing toxins from the body while balancing the Doshas, the energies that govern all biological functions; the three Doshas are known as Vata, Pitta and Kapha (Clements, 2007).
Vamana
Vamana is a medicated emesis therapy, which removes Kapha toxins collected in the body and the respiratory tract. This is given to people with high Kapha imbalance. Daily treatment involves loosening and mobilizing the toxins in an effort to finally eliminate them.

Virechana (Purgation)
Virechana is medicated purgation therapy, which removes Pitta toxins from the body that are accumulated in the liver and gallbladder; it completely cleanses the gastro-intestinal tract. It is a safe procedure without side effects.

Basti (Enema or Colonic Irrigation)
Basti (Enema) is considered as the mother of all Panchakarma treatments since it cleanses the accumulated toxins from all the three Doshas, Vata, Pitta and Kapha, through the colon. Basti is also highly beneficial as a rejuvenating treatment. Medicated oil or ghee and an herbal decoction is given as enema to clean the colon and increase the muscle tone. This procedure is usually applied for 8 to 30 days, based on the medical condition of a person.

Nasya (Nose Cleaning)
Nasya involves administration of medicated oil through the nose to cleanse accumulated Kapha toxins from the head and neck region. Based on the medical condition of a person, it can be given up to 30 days (Caldecott, 2006, p. 94).

Raktamokshana
Raktamokshana is a procedure to cleanse the blood and is advised only in very rare conditions. It is not advisable during general Panchakarma (Murthy, 1987; Murthy, 2001; Pandey, 2002).

Complementary Alternative Medicine (CAM)
Complementary Alternative Medicine (CAM) includes Naturopathy, Western Herbalism, Homeopathy and Functional or Nutrition Medicine. Naturopathic beliefs, including those of ‘naturopathic physicians’ are rooted in vitalism, the pre-20th century assertion that biological processes do not conform to universal physical and chemical principles (Jarvis, 2000). Naturopaths describe a healing power of nature, which is compromised by modern medicine (Atwood, 2001).

Naturopathy as a discipline began in 19th century Europe (Langley, 2007). Known simply as the nature cure, it spread to the United States and acquired its present name around the turn of the century (Lloyd & Lloyd, 1909). One of the European founders of Naturopathy was Priessnitz (1799-1852). Priessnitz
developed a system of water cures that he used successfully on himself and many others. Priessnitz relied on nothing except cold water, a simple diet, and physical activity to heal his patients. The task is not to treat the disease, but the patient (Slinták, 2005).

Hahn (1824-1883) was a self-taught lay practitioner who advocated using the water cure along with a vegetarian diet (Sager, Potenza, Oxendine, & Guillemette, 2006). Hahn held the very modern belief that the nature doctor should be an educator who brought the knowledge of healthful living and natural treatments to the people so that they would realise they were responsible for their own health (Kuhne & Lust, 2003).

Kneipp (1824-1897) provided the link between the European nature cure and American naturopathy (Buchman, 2001). Kneipp was a priest, and physical healing was as much a part of his ministry as was saving souls. His approach to healing was holistic, advocating the balance between work and leisure, stress and relaxation and the harmony between the mental, emotional, physical, social, and ecological planes (Buchman, 2001). In short, he asked the patient for a different lifestyle, not to prescribe better pills; he asked for the active patient participation and rejected the passive one (Whorton, 2002).

Western herbal medicine (WHM) was originally a part of orthodox medicine (Wood, 2004). Western herbalism has its roots in Native American and traditional European usage of medicinal plants. This knowledge and history of plant medicine is thousands of years old (Wood, 2004). Plant knowledge from other countries has also been woven into the body of knowledge used in Western herbalism from other cultures including China (Foster & Chongxi, 1992). Western herbalism primarily utilises plants native to North America (Holmes, 2001; Kowalchik & Hylton, 1987).

Western herbalism is based on clinical experience and the traditional knowledge of medicinal plant remedies preserved by oral tradition and in written records over thousands of years (WHO, 2002). Western herbalism, like the much older system of traditional Chinese medicine, relies on the synergistic and curative properties of the plant to treat symptoms and disease and maintain health (Hanrahan, 2008).

Functional or nutrition medicine (FM) focuses not on endpoint or pathological state, but on the dynamic processes, which underlie and precede it (Lipski, 2008). While acknowledging the existence of pathology as well as a need to understand it, FM focuses on the underlying processes and seeks a path of therapy, which engages these underlying events (Lipski, 2008).
The Institute for Functional Medicine ([IFM], 2008, p. 1) defines it as “a personalised medicine that deals with primary prevention and underlying causes instead of symptoms for serious chronic disease” and is grounded in the following principles:

- Biochemical individuality
- Patient-centred medicine
- Dynamic balance of internal and external factors
- Web-like interconnections of physiological factors
- Health as a positive vitality

Nutrition medicine addresses any existing nutritional imbalances. Nutrients (vitamins, minerals, fatty acids, amino acids, glyconutrients) and non-nutrient bioactive compounds (probiotics, herbs, enzymes, hydrochloric acid and phytochemicals) can also be used therapeutically to assist in the correction of many underlying physical factors, which are contributing to disease states (Higdon, 2003, 2007).

Homeopathy is a healing system that has been around for 200 years (Wood, 2000). Hahnemann, its founder, stumbled upon a principle that was already hinted at by healers for many centuries – the law of similars (Wood, 2000). This important principle was that substances in our surroundings that bring forth certain symptoms in healthy people will act as remedies when given in very small amounts to sick people with similar symptoms (Cummings & Ullman, 2004).

Classical homeopathy is defined as the original system developed by Hahnemann, where the practitioner makes an in-depth analysis of the patient and matches a single remedy to the symptoms of this patient (Lockie, 2006). In contrast, some practitioners practice ‘pluralist’ homeopathy where more than one remedy is given at the same time, or ‘formula’ homeopathy where a pre-prepared formula of different remedies is given to the patient (Lockie & Geddes, 1995).

Constitutional homeopathy is similar to classical homeopathy where a single remedy is used to treat a patient (Lockie, 2006). The theory is that in constitutional homeopathy each single remedy has a set of traits and these traits must correspond with the personality traits of the client. The underlying assumption of constitutional homeopathy is that a human being is a holistic entity and that disease symptoms cannot be viewed outside the context of a person’s whole constitutional make-up (Bailey, 1995; Grandgeorge, 1998).
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CHAPTER 3
CAM AND CANCER
As widely varied as the above medicines are, it is extremely difficult to integrate them into a rational system as is done in traditional medicines and orthodox medicine (Adler, 1999, 2002).

Ernst et al. (1995) define complementary and alternative medicine as “diagnosis, treatment and/or prevention which complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual frameworks of medicine” (p. 506). It comprises a confusingly large and heterogeneous array of techniques, with both therapeutic and diagnostic approaches (see also Ernst, 2000).

Rakel and Weil (2007) observe in their chapter Philosophy of Integrative Medicine that CAM is not synonymous with integrative medicine. CAM is a collection of therapies, many of which have a similar holistic philosophy. This philosophy is a relationship centred care, which focuses on the individual patient’s needs and active participation in the healing. Rakel and Jonas (2007) further state that the function of integrative medicine is to create the optimal healing environment. They further state that treatment contributes only 25% to the healing process.

Many providers of complementary and alternative medicine are convinced that their therapy defies the “straightjacket” of reductionist research (Ernst, 2000). They argue that it is individualised, holistic, intuitive, etc. and call for a paradigm shift in research (Ernst, 2000). Usually these arguments are based on a series of misunderstandings, and often clearly defining the research question and subsequently finding the research tool that optimally matches it can resolve the problems (Vickers, Cassileth, & Ernst, 1997). An overwhelming effort is being made toward integrating alternative practices into the mainstream. Sixty percent of medical schools (in the US) have begun to teach about alternative medicine practices (Wetzel, Eisenberg, & Kaptchuk, 1998). Hospitals are creating complementary and integrated medicine programs, health suppliers are offering expanded benefits packages that include the services of alternative practitioners (Pelletier, Marie, Krasner, & Haskell, 1997). Research in CAM will help identify what is safe and effective and will further the understanding of biology by exploring, rather than marginalising, unorthodox medical claims and findings (Jonas, 1997).

Contrary to many researchers’ beliefs, current methodologies in science i.e. trials, epidemiology studies and data analysis are more than satisfactory for addressing the majority of questions related to CAM, from clinical research on efficacy to basic pharmacology (Levin et al., 1997).

The major criticisms and limitations of Evidence-Based Medicine (EBM) ap-
pearing in the literature over the past decade can be summarised and catego-

rised into five recurring themes. The themes include: reliance on empiricism, narrow definition of evidence, lack of evidence of efficacy, limited usefulness for individual patients, and threats to the autonomy of the doctor/patient relationship (Cohen, Stavri & Hersh, 2004).

To diagnose, naturopaths use an assortment of non-standard methods, among which are iridology or iris diagnosis, which holds that the entire body is represented on the iris of the eye (Bastyr University, 2003); applied kinesiology, and hair analysis for alleged toxins and vitamin and mineral deficiencies. Other non-recognised diagnostic tools include electrodagnosis, “live cell analysis”; “pulse” and “tongue” diagnosis (Atwood, 2001; Barrett, 2003).

A report to the Victorian State government in 2005 on naturopathy and Western herbalism, from the School of Public Health at La Trobe University (Lin et al., 2005), found it difficult to codify the practice. The report found a major difficulty in determining the benefits of naturopathy and WHM in that these disciplines have not been subject to systematic investigation of the manner in which the disciplines are practised in the community.

Whole practice (or whole systems) research assesses the way that practitioners actually practice. In clinical practice, naturopaths and Western herbalists use multiple therapeutic tools accompanied by dietary and lifestyle assessment and advice, patient education, and counselling. Researching a single herb or nutrient does not reflect the whole of practice. Whole practice research is an emerging research field within complementary medicine, and although several projects are currently being planned and implemented, there are no data available about the efficacy or safety of these disciplines within a holistic model (Lin et al., 2005; see also Harris, 2000).

Naturopaths may invoke simplistic theories to explain the causes of disease. These include the actions of ubiquitous ‘toxins’ (including most pharmaceuticals); widespread food allergies; dietary sugar, fat, and gluten; inadequate vitamin and mineral intake; epidemic candidiasis; vertebral misalignments; intestinal ‘dysbiosis’ and a few others (Beyerstein & Downey, 2000).

However, a large degree of variability most likely is due to different understandings of complementary/alternative medicine on the part of investigators. It is likely that the results of the current study reflect the primarily adjunctive use of CAM treatments. Future studies should use a standardised protocol to determine the true prevalence of these therapies more closely (Ernst & Cassileth, 1998).
Micozzi, a noted researcher in CAM and founding editor in 2002 of the *Journal of CAM*, states that “there is developing evidence that many CAM therapies may be effectively used in an adjunctive and supportive role in the cancer patient for the management of both complications of the disease and complications of the medical treatment of such” (Micozzi, 2007a, p. xxii). Micozzi’s definition of cancer (see Micozzi, 2007a) is completely in keeping with those definitions posited by OM and the NCI but from a more philosophical point of view. He does state in his chapter on *Cancer as a Biologic Phenomenon* that “When cancer is viewed as a biologic phenomenon, it becomes apparent that this disease is part of the landscape of human experience…” and “the reason for the existence of cancer, its biologic basis, is sought within the realm of natural history and human biology” (Micozzi, 2007b, p. 13). The cause of cancer from this point of view is imbalance in “psychoneuro-immunology, which demonstrates the body is a seamless web and its multiplicity of brain/immune system/gut/liver connections” (Micozzi, p. 13). Perhaps CAM is beginning to develop a system of understanding and application, which may become an adjunct to orthodox medicine but with its own nomenclature and rationale.

**Discussion**

Rational and empirical medicines differ in how they developed their ideas. In rational medicine, the emphasis is on deductive logic and in empirical medicine the emphasis is on practical experience. However, the difference is only in emphasis, as both schools use logic and experience, only in different degrees (Coulter, 1994). Coulter goes on to say (p. 247) “Rational medicine attempts to be deductive and while empirical medicine has always been in the minority when compared to the dominant school of rational medicine, the relative influence of both has varied through history”.

Empirical physicals must take into account the experiences about the circumstances and the individuality of the patient (the *idiosyncrasies*) without sacrificing the particular to the general and granting primary status to phenomena (Reale, 1990, pp. 130-1; italics in original). Perhaps the reason empiricism has always been in the minority is because it is harder to do. Empiricism is vitalistic, individualises the treatment to the patient and is oriented towards treating the patient’s underlying condition. Rational medicine, in contrast, is mechanistic, disease rather than patient oriented (Coulter, 1994).

There are understandable differences between orthodox medicine and T-CAM but also differences between traditional medicines and Western complementary medicines. Cultural differences reflected in the professional culture of medicine can be viewed as the language, thought processes, styles of communication,
customs, and beliefs that often characterise the profession of medicine (Kleinman, Eisenberg, & Good, 1978). Also, the way in which physicians conceptualise health is another example of the physician’s culture. This is referred to as the explanatory model and when used in reference to patients, explanatory models describe how patients interpret the meaning of an illness and the impact that it has on their ability to function (Kleinman et al., 1987).

Hyman, a contributing editor of Alternative Therapies in Health and Medicine, suggests that integrative medicine is not integrated (Hyman, 2009). He goes on to say (p. 20) “a coherent scientific map for filtering a patient’s story into a personalised care plan does not exist in clinical medicine, whether conventional or integrative”. Furthermore, he says (p. 21), “alternative therapies and conventional treatments are tools…we need a new map… and that map is functional medicine, a system of thinking about patterns, connections…that encompasses all modalities”.

Medicine is cultural and changing over time. However, most cultures are basically conservative in that they tend to resist change. Others, like China, have over the last two decades been rapidly adopting Western technology and culture in everyday life, while attempting to preserve their traditions (O’Neil, 2006). A culture’s idiom of distress not only influences clinical care and but also has a great impact on medical theory and the formalised voice of medicine. For example, Chinese and Japanese medical theoreticians speak of the liver and the heart as more sensitive to emotional issues than other organs (Kaptchuk, 1998).
References


CAM and Cancer

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CHAPTER 4

APPLICATION OF THERAPIES

Orthodox Medicine ................................................................. 72
Traditional Medicines ................................................................. 72
  TCM ....................................................................................... 72
  Ayurvedic Medicine ................................................................. 83
CAM / Supplements ................................................................... 90-92
  Compounds and Supplements in Chemotherapy ......................... 94
Homeopathy ............................................................................... 95
Discussion .................................................................................. 96
ORTHODOX MEDICINE

OM strategies and protocols include surgery, radiotherapy, chemotherapy and hormonal treatment. The exact interventions are not relevant to this paper; however in a later paper herbs, compounds and supplements that work with OM interventions will be examined. In that section specific OM protocols will be listed.

TRADITIONAL MEDICINES

TCM

The Chinese have been integrating cancer treatment for the past 60 years. Using OM and TCM, this integration has evolved into a sophisticated hybrid of medicine that has generated a great deal of well-designed research demonstrating that the use of combined care can improve outcomes for patients with cancer (Lahans, 2007). The isolation of natural products and the elucidation of their chemical structures enable pharmacologic and molecular biological investigations (Efferth et al., 2007). The identification of target molecules represents the basis for the development of rational treatment strategies for natural products from traditional Chinese medicine activity against tumour cells (Efferth et al., 2008).

A Chinese study (Campbell et al., 2002) on a number of herbs and their effect on various cancer cell lines indicate significant growth inhibitory effects. The results indicate that many of the herbs used in traditional Chinese medicine for the treatment of cancer have significant growth inhibitory effects on breast cancer cells in vitro (Campbell et al, 2002). This is an example of many studies on Chinese herbs and their effect on cancer cell lines; Shoemaker, Hamilton, Dairkee, Cohen, & Campbell in 2005 conducted another study on eight cancer cell lines (Shoemaker et al., 2005), and Zhou and Su (2007) did a review on breast cancer cell lines and found many compounds having anti-cancer activities through inhibition of the growth and proliferation of breast cancer cells, restraining metastasis, reducing oestrogen-like activity and improving multi-drug resistance. PubMed has an additional 16 studies available (retrieved February, 2009).

TCM divides the action of the herbs into different activities. Bu fa, which translates as support, reinforces body resistance and tonifies, consolidating the constitution. Gong fa, which translates as attack, is designed to eliminate pathogenic agents. The ratio between bu ba and gong fa is dependent upon the nature of the tumour, the strength of the patient, the toxic overload and the stage or progression of the cancer. Bu fa has activities which promote immune
response while gong fa is divided into five categories: Toxic Heat removing, Blood Activating, regulating qi and eliminating Phlegm, coursing Liver qi stagnation & melancholia, and Softening Lumps & Dispelling Nodules.

Gong fa/bu fa theory was formally raised by Zhang Congzheng (also known as Zhang Zihe, Jin Dynasty, 1156-1228 CE) in his book *Ru Men Shi Qin* (*The Scholar’s Care of Relatives*), of the purge the pathogen school (Zhang, Dong, & Roman, 2006). The book addresses gong fa and bu fa and Zhang’s theory was developed from the *Huang Di Nei Jing* (*The Yellow Emperor’s Inner Classic*) (Unschuld, 2003). Zhang’s most famous principle is: use gong fa when there is excess, use bu fa when there is deficiency; when there is excess, use gong fa to the son, when there is deficiency, use bu fa to the mother (Zhang, Dong, & Roman, p. 783).

All formulations have both factors included in the herbal makeup and the choice of formula weighs towards bu fa or gong fa. Almost all Western nutraceuticals are bu fa but some have a component of gong fa. Chemotherapy and radiotherapy are gong fa.
Table 7  
Bu fa or reinforcing body resistance / tonifying; consolidating the constitution

<table>
<thead>
<tr>
<th>Herb</th>
<th>Action</th>
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<tbody>
<tr>
<td><strong>Astragalus membranaceus</strong></td>
<td>Increased immune response, increased the amount of RNA, decreased the alkaline RNase activity in liver and spleen of mice and had a smaller effect on acid RNase but no effect on serum RNase. Increased the phagocytic activity of the reticuloendothelial system (Weng &amp; Fang, 1998, p. 1218). Astragalus polysaccharides (APS) activates mouse B cells and macrophages, but not T cells, in terms of proliferation or cytokine production and activates B cells via membrane Ig in a TLR4-independent manner (Shao, B. et al., 2004, p. 1103).</td>
</tr>
<tr>
<td>(huang qi)</td>
<td></td>
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<tr>
<td><strong>Panax Ginseng</strong></td>
<td>Increases the phagocytosis of reticuloendothelial system, can increase the lymphocyte transformation rate and -globin, IgM in healthy human beings. It can increase the activity of NKC and the production of interferon (Weng &amp; Fang, 1998, p. 1201).</td>
</tr>
<tr>
<td>(ren shen)</td>
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</table>
| **Sporophore Ganoderma lucidum** | Promotes the phagocytosis rate of celiac macrophages and activity of lysosome in mice, inhibits DNA synthesis in lymphocytes and T and B lymphocyte transformation induced by ConA and bacillus coli endotoxin. Stimulates spleen cell proliferation and cytokine expression (Weng & Fang, 1998, p. 1050).  
Water decoction of ling zhi could inhibit the growth of tumour. Hot water extract of mycelia of artificially cultured ling zhi had inhibitory effect on the growth of fibrosarcoma and metastasized focus of lung. Ganodenic acid, a kind of triterpene isolated from chi zhi, had cell toxicant on cultured liver carcinoma in vitro (Weng & Fang, 1998, p. 1051). 
The alcohol extract of Ganoderma lucidum inhibited cell proliferation in a dose- and time-dependent manner, which might be mediated through up-regulation of p21/Waf1 and down-regulation of cyclin D1 and directly induce apoptosis in MCF-7 cells (Hu, Ahn, Yang, Lee, & Kang, 2002). |
| (ling zhi)                     |                                                                                                                                                                                                      |
Table 7
Bu fa or reinforcing body resistance / tonifying; consolidating the constitution

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<tr>
<th>Herb</th>
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<tr>
<td>Codonopsis pilosula (dang shen)</td>
<td>Has a stimulatory effect on immunoglobulin (Ig) production by B-cells and interleukin (IL)-1 production by monocytes (Shan, Yoshida, Sugiura, &amp; Yamashita, 1999).</td>
</tr>
<tr>
<td>Cuscuta chinensis (tu si zi)</td>
<td>An ethanol extract of Semen Cuscutae (EESC) was evaluated for its adjuvant potentials on the cellular and humoral immune responses of ICR mice against ovalbumin (OVA) and the results suggest that EESC is effective on Th1 and Th2 cell functions, and could be safely used as adjuvant (Pan, Sun, &amp; Pan, 2005).</td>
</tr>
<tr>
<td>Asparagus cochinchinensis (tian dong)</td>
<td>The antiproliferative activities against human cervix HeLa adenocarcinoma, human lung A549 adenocarcinoma, murine colon 26-L5 carcinoma, murine Lewis lung carcinoma (LLC) and murine B16-BL6 melanoma cells indicate morphological change and DNA fragmentation due to the induction of apoptosis (Ueda et al. 2002, p. 753).</td>
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Table 8

Gong fa, eliminating pathogenic agents: Toxic Heat Removing

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<th>Herb</th>
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<tr>
<td>Sophorae tonkinensis (shan dou gen)</td>
<td>Gastrogavage of water infusion or warm infusion of Sophorae at the dosage 60g/kg for consecutive 10~21 days to mice had significant inhibitory effect on inoculated cervical cancer U14, it had an inhibitory effect of over 25% on sarcoma S180. Intraperitoneal injection of water extract of powder of shan dou gen at the dosage of 500-mg/kg had a curative rate of over 60% on sarcoma and solid liver tumour of ascitic type in rats. At the dosage of 300-mg/kg, it could delay the formation of ascites and prolong the survival time in rats with solid liver tumour of ascites type (Dou, Li, &amp; Yan, 1989).</td>
</tr>
<tr>
<td>Actinidia arguta (teng li gen)</td>
<td>The use of teng li gen for anti-tumour metastasis in the lungs and the inhibitory effect of extracts from Actinidia arguta and differentiation of the tumour cells (Liang, Xue, Zhou, &amp; Li, 2003).</td>
</tr>
<tr>
<td>Arebiae seu Lithospermi (zi cao)</td>
<td>Treatment with Lithospermi radix, Astragali radix, and Cnidii rhizoma significantly inhibited BBN-induced suppression chemotactic activity and production of IL-1 and TNF- by macrophages (Jin &amp; Kurashige, 1996).</td>
</tr>
<tr>
<td>Dioscorea bulbifera (huang yao zi)</td>
<td>Daily administration in decoction for 5 to 8 weeks had an 80% overall rate of effectiveness for 25 patients in one study from Fujian (Weng &amp; Fang, 1998, p. 820). Dioscorea bulbifera L. showed an inhibitory effect against the tumour promotion of JB6 (Cl 22 and Cl 41) cells induced by a promoter, 12-O-tetradecanoylphorbol-13-acetate (TPA) (Gao et al., 2002).</td>
</tr>
</tbody>
</table>
### Table 8

**Gong fa, eliminating pathogenic agents: Toxic Heat Removing**

<table>
<thead>
<tr>
<th>Herb</th>
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</table>
| Paris polyphylla (zao xiu or cao he che) | zao xiu at the dosage of 3.1-mg/ml had inhibitory effect on ehrlich carcinoma and liver cancer in mice and the inhibitory effect was 40~50\% (Weng & Fang, 1998, p. 363.).
Paris polyphylla showed a predominant inhibitory effect on all the cell lines with IC50 values ranging from 10 \(\mu\)g/ml to 30 \(\mu\)g/ml. The findings in this study suggested that traditional Chinese medicines, especially Paris polyphylla, might have potential anticancer activity on digestive cancer (Sun, Liu, Hu, Yu, & Qian, 2007). |
| Juglans regia (he tao shu zhi) | Water decoction of He Tao Shu Zhi could elevate IL-2 and lower IL-4 level in peripheral blood, increase the expression of CD4+ T cell, and lower the expression of CD8+ T cell, which indicated that He Tao Shu Zhi could exert its anti-tumour effect through regulating abnormal immune state (Yu & Zhang, 2006). |
Table 9
Gong fa, eliminating pathogenic agents: Blood Activating

<table>
<thead>
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<th>Herb</th>
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<tr>
<td>Curcumae zeloariae (e zhu)</td>
<td>Two kinds of Chinese traditional herbs, rhizoma Curcumae zeloariae and Rhizoma Spargani (below) used in lung cancer cell line A549. The research examined tumour cell apoptosis induced by the herbs with flow cytometry when the target cell was cultured with the herb substraction for 24h. The substraction of herbs induced tumour cell apoptosis. The results suggested that to induce target cells apoptosis is the main mechanism in inhibiting and killing tumours by the herbs (Wang, Zhang, &amp; Fu, 2001).</td>
</tr>
<tr>
<td>Sparganium stoloniferum (san leng)</td>
<td>San leng had inhibitory effect on cancer cells. 30% san leng / e zhu Injection had significant inhibitory effect on S180 in mice (Weng &amp; Fang, 1998, p. 951). Sparganium stoloniferum extract inhibited the proliferation of breast cancer cells and the activation of caspases-3 was also increased in a time- and dose- dependent manner. The cleavage of the full-length PARP (116 kd) by caspase-3 have generated the 89-kd cleaved PARP fragment after the treatment and increasing the extract concentration from 1 to 2 mg/ml has significantly increased the caspase-3 induced PARP fragmentation (Cho, S-I, Cho, Kim, &amp; Dhayal, 2006.)</td>
</tr>
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### Table 10

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<th>Herb</th>
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<tr>
<td><strong>Fritillariae thunbergii</strong> (zhe bei mu)</td>
<td>Used as an adjunctive in chemotherapy. The incidence of grade 3/4 anaemia, leukopaenia, neutropenia, and thrombocytopenia for the CHM and placebo groups were 5.4%, 47.3%, 52.7%, and 1.8%, and 1.8%, respectively. Incidence of grade 2 nausea was the only non-haematologic toxicity that was significantly reduced in the CHM group (14.6% versus 35.7%, P=0.04) (Mok et al., 2007).</td>
</tr>
<tr>
<td><strong>Fagopyrum cymosum</strong> extract (Fago-c) (jin qiao mai)</td>
<td>Jin qiao mai had significant inhibitory effect on the growth of human lung adenocarcinoma, nasopharyngeal squamous cell carcinoma, stomach adenocarcinoma and cervical squamous cell carcinoma, and the effect was in direct ratio to the concentration (Weng &amp; Fang, 1998, p. 460). The growth of cancer cells from lung, liver, colon, leukocytes and bone is inhibited by Fago-c. However, cancer cells derived from prostate, cervix, ovary and brain are not sensitive to Fago-c, and the extract stimulates the growth of cancer cells from breast (MCF-7). Synergistic inhibition effect of Fago-c and daunomycin was observed in human lung cancer cells (H460) (Chan, 2003).</td>
</tr>
</tbody>
</table>
### Table 10
**Gong fa, eliminating pathogenic agents: Regulating Qi and Eliminating Phlegm**

<table>
<thead>
<tr>
<th>Herb</th>
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<tbody>
<tr>
<td><strong>Trichosanthes kirilowii</strong></td>
<td>In vitro experiments showed that gua lou decoction and extracts of gua lou peel and kernel had killing effect on ascites cancer cells in mice. Animal tests showed that gua lou had certain inhibitory effect on sarcoma, but had no obvious effects on ascites cancer. There are also reports showing that preparations of gua lou had no effects on transplanted cervical cancer, lymphosarcoma-1 and S180 (Weng &amp; Fang, 1998). Trichosanthen, from Trichosanthes, the N-terminal peptides (amino acid residues #1-15 and 16-30) caused increases in ConA stimulated incorporation of 3[H] thymidine into normal spleen cells at low concentrations of the peptides (5 micrograms/ml). The viability of spleen cells and L1210 cells were not affected by these peptides at 5 micrograms/ml. These N-terminal peptides (#1-15 and 16-30) were tested for in vivo anti-tumour activity. There was a delay of tumour formation in the treated vs. control group. The results suggest that N-terminal sequences of trichosanthen have anti-tumour activity (Takemoto, 1998).</td>
</tr>
<tr>
<td><strong>Magnolia officinalis</strong></td>
<td>Suppresses proliferation of cultured human colon and liver cancer cells by inhibiting DNA synthesis and activating apoptosis (Lin et al., 2001). Multiple i.p administration of 10 mg/kg of magnolol after and before tumour inoculation significantly suppressed lung metastasis and primary tumour growth (Ikeda, Sakai, &amp; Nagase, 2003).</td>
</tr>
<tr>
<td>Herb</td>
<td>Action</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Bupleurum chinensis (chai hu)</td>
<td>Bupleurum possess immunomodulating effects and cytokine production by human lymphocytes stimulated by a herbal compound containing Bupleurum chinensis (Chow, Loo, &amp; Sham, 2003). Bupleuri radix saponins showed an inhibitory effect on adhesion of some solid tumour cells and relation to haemolytic action (Ahn, Yoon, Lee, Kim, &amp; Sok, 1998).</td>
</tr>
<tr>
<td>Curcuma aromatica (yu jin)</td>
<td>Histological improvement was seen in one of two patients with bladder cancer, two of seven patients with leucoplakia, one of six patients with intestinal metaplasia, one of four patients with C1N, and two of six patients with Bowen’s disease (Ruby, Kuttan, Babu, Rajasekharan, &amp; Kuttan, 1995).</td>
</tr>
<tr>
<td>Curcuma longae (jiang Huang)</td>
<td>Inhibits the promotion/progression stages of colon cancer (the author lists over 40 chemopreventive effects) (Aggarwal, Kumar, &amp; Bharti, 2003, p. 366).</td>
</tr>
<tr>
<td>Foeniculi vulgaris (xiao hui xian)</td>
<td>Foeniculi vulgaris was remarkably effective in the restoration of impaired immune functions of old mice, in terms of number of T cells and NK cells, and anti-SRBC antibody response, while it was not effective in enhancing immune functions of young mice (Utsuyamaa, Seidlara, Kitagawaa, &amp; Kirokawa, 2001, p. 348).</td>
</tr>
<tr>
<td>Linderae strychnifoliae (wu yao)</td>
<td>Linderae strychnifoliae shows cytotoxic effects against several tumour cell lines and inhibits macromolecule biosynthesis and prolonged survival time and inhibited tumour growth in a dose-dependent manner by inducing apoptosis in the LL-2 cell mice model (Li, et al., 2003, p. 857).</td>
</tr>
</tbody>
</table>
### Table 12

**Gong fa, eliminating pathogenic agents: Softening Lumps & Dispelling Nodules**

<table>
<thead>
<tr>
<th>Herb</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1158</td>
<td>Induced TNF-a production (Weng &amp; Fang, 1998, p. 363).</td>
</tr>
<tr>
<td>Bombyx Batryticatus, larva (jiang can)</td>
<td>Ethanol extract of jiang can inhibit the growth of S180 in mice. It could also inhibit the development of human liver cancer cell in vitro (Weng &amp; Fang, 1998, p. 1158).</td>
</tr>
<tr>
<td>Gleditsia Sinensis (zao jiao)</td>
<td>Gleditsia sinensis possesses apoptotic activity on numerous solid tumour and leukaemia cell lines as well as primary cultured leukaemia cells obtained from bone marrow aspirate of patients (Chui et al. 2005).</td>
</tr>
<tr>
<td>Arca subcrenata (wa leng zi)</td>
<td>Two proteins from <em>A. subcrenata</em> inhibited the proliferation of human tumour cells in vitro (Song et al. 2008, p. 427).</td>
</tr>
</tbody>
</table>
### Table 13
*Compounds Isolated from Chinese Herbs*

<table>
<thead>
<tr>
<th>Compound</th>
<th>Origin</th>
<th>Pharmacology</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irisquinone</td>
<td>Semen Iris pallasii (Ma Lin)</td>
<td>Antitumour</td>
<td>Cervix carcinoma</td>
</tr>
<tr>
<td>Oridonine &amp; Rubescensine A</td>
<td>Herba Rabdosia rubescens (Dong Ling Cao)</td>
<td>Antitumour</td>
<td>Oesophageal cancer</td>
</tr>
<tr>
<td>Harringtonine &amp; Homoharringtonine</td>
<td>Cephalotaxus hainanensis (Cu Fei)</td>
<td>Antitumour</td>
<td>Leukaemia</td>
</tr>
<tr>
<td>Monocrotaline</td>
<td>Crotalaria sessiliflora (Nong Ji Li)</td>
<td>Antitumour (toxic)</td>
<td>Cervix carcinoma</td>
</tr>
<tr>
<td>Berbamine</td>
<td>Most Berberis Species i.e. Rhizoma Coptidis (Huang Lian)</td>
<td>Immune regulation, increases leukocytes</td>
<td>Adjuvant in Chemotherapy and Radiotherapy</td>
</tr>
</tbody>
</table>

(Žong GUO YAO LI XUE BAO 1986; Efferth et al 2002; Zhou & Wang 1985)

**AYURVEDIC MEDICINE**

See Ayurvedic Glossary Page 188

Ayurvedic herbs are widely used and scientifically proven of their anticancer properties. Some of these herbs are shown to enhance the therapeutic efficacy and/or reduce the toxicity of anticancer drugs used in chemotherapy. Few also possess radio-sensitising effects (Smit et al., 1995)

The philosophy of Ayurveda believes that no importance is attached to the name of the disease but that different combinations of the three Doshas are responsible and therefore diagnosis of the disease is based upon these humours (Sastry, 2001). The three Doshas of Ayurveda and their five respective subdoshas are related to the modern scientific framework of systems theory, phase transitions, and irreversible thermodynamics and these empirically well-established concepts of Ayurveda appear to be far more general biologic concepts than the neuroendocrinology of their functioning might imply. They express universal concepts applicable across living organisms—control structures governing living systems (Hankey, 2001).
### Table 14

**Physiologic Functions Assigned to the Three Doshas**

<table>
<thead>
<tr>
<th>Vata</th>
<th>Pita</th>
<th>Kapha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Digestion</td>
<td>Connecting structures</td>
</tr>
<tr>
<td>Transport</td>
<td>Transformation</td>
<td>Cohesion</td>
</tr>
<tr>
<td>Movement</td>
<td>Metabolism</td>
<td>Lubrication</td>
</tr>
</tbody>
</table>

When in balance, vata promotes creativity and flexibility. Out of balance, vata produces fear and anxiety. Physical ailments connected to the air element, such as emphysema, pneumonia and arthritis, are predominant.

When in balance, pitta promotes intelligence and understanding. Out of balance, pitta produces anger and jealousy. Physical ailments connected to the fire element, such as fevers, inflammatory diseases and jaundice, are predominant.

When in balance, kapha promotes calmness and forgiveness. Out of balance, kapha produces greed and envy. Physical ailments connected to the water element, such as the flu, sinus congestion and excess mucus, are predominant.


Ayurveda’s Doshas can be identified as regulatory control factors for fundamental physiologic processes in living systems that maintain their identity throughout biologic history: vata and its subdhoshas regulating input/output processes and motion; pitta and its subdoshas regulating throughput, turnover, and hence energy; and kapha and its subdoshas regulating storage, structure, and lubrication (Bhishagratna, 1980).

In Ayurveda, the medicinal properties of herbs are discovered by experiencing or observing the physical effects that herbs have on the human body (*empirical*). The physical effects, also known as the energetics or energies, of the herbs are classified into four groups by the order of their perception by the human body: rasa (taste), virya (heat), vipaka (post-digestive effect), and prabhava (unique action) (Frawley & Lad, 2001).

Ayurveda believes the cancer will occur as a result of the improper treatment of the granthis and the Arbuda is a later manifestation of granthi (Devaraj, 1999)
Classical treatment protocols for various tumours in Ayurveda

*Granthi* is a term for a tumour, lump or nodule that is visible from the surface. These tumours often open up on the surface of the skin as an ulcer (*vrana*). Granthi may be benign or malignant; however the term is most often used to describe benign tumours (Sahu & Mishra, 2004).

Granthi subtypes; *Vatika granthi* presents with a visible tumour that is black or dark in colour and is non fixed. It is able to move from place to place if pushed. Its size may fluctuate. It tends to be soft and if pricked, exudes a clear, thin fluid (Devaraj 1999).

*Paittika granthi* presents with burning sensation over the tumour. The tumour or the region surrounding it will be yellow or red in colour. The tumour suppurates quickly and easily and exudes a warm blood when pricked (Sahu & Mishra, 2004).

*Kapaja granthi* presents as a painless, hard tumour whose colour is pale. The area around the tumour is cool and itches. The tumour suppurates slowly and if pricked, exudes thick, white, cloudy pus (Sahu & Mishra, 2004).

Vatika granthi is treated with Helloborus niger, Tinospora cordifolia, Clerodendron serratum, Aegle marmelos, Hoya viridiflora, Elephantopus scaber, Soymida febrifuga and Gynandropsis pentaphylla to be applied locally (Dash & Kashyap, 1987).

Paittika granthi is treated with Terminalia chebula powder with either grape or sugarcane juice used orally. The paste of Glycyrrhiza glabra, Eugenia jambo-lana, Terminalia arjuna or Calamus rotang were used in external application (Dash & Kashyap, 1987).

Kapaja granthi is treated with a paste of Capparis spinosa, Capparis sepiaria, Agati grandiflora, Lagenaria vulgaris, Premna herbacea, Pongamia glabra, Musa sapientum and Randia dumetorum in local external application (Dash & Kashyap, 1987).

The Classical procedures for granthi involve fomentations, cauterisation, scraping, blood-letting, medicated enemata and other surgical procedures (Sastry, 2001, pp. 1–24) and traditional treatments for all granthi involve habitual intake of Basella rubra or application of alkali preparation of Musa paradisiaca, Conch shell ash, Elaeocarpus tuberculatus, Sulphur, potassium carbonate, Embelia ribes and ginger were used to cure arbuda [the specific term for a malig-
nancy] (Dash & Kashyap, 1987).

The word *arbuda* has been derived from the root *arb* and the suffix *ena* with augmentation *nd*, which means destroy (Sahu & Mishra, 2004, p. 275). Treatments for vataja arbuda stage 1 tumours involve the use of a paste of Benincasa cerifera, Cucumis memordica, Cocos nucifera, and Eranda beeja, Ricinus communis along with butter or milk applied to the tumour (Singhal & Singh, 1982).

Pittaja arbuda tumours at stage 2 were treated with leaves of Ficus glomerata, Tectona grandis, and Elephantopus scaber repeatedly and then with a honey mixed fine paste of Aglaja roxburghiana, Caesalpinia sappa, Symplocos racemosa, Terminalia arjuna, Xanthium strumarium was applied (Dash & Kashyap, 1987).

After surgical removal of tumour kaphaja arbuda (stage 3) drugs that remove Doshas from both the ends (vomiting and purgation) were employed. Then for purification, a decoction of Clitoria ternatea, Jasminum grandiflorum and Nerium odorum leaves was used. For the postoperative care, oil cooked with Premna herbacea, Embelia ribes, Cissampelos pareira was applied. Medoja arbuda, Curcuma domestica, and Triticum sativum, Symplocos racemosa, etc. were made into a powder and applied externally by mixing them with honey. Oil from Panama glabra was used for internal administration (Singhal & Singh, 1982).
<table>
<thead>
<tr>
<th>Herb</th>
<th>Action/Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium sativum</td>
<td>Sarcoma (rat) (Hu et al. 2002).</td>
</tr>
<tr>
<td>Aloe vera</td>
<td>Yoshida AH-130 ascites Hepatoma (pleural tumour) Human neuroectodermal tumours (Corsi, Bertelli, &amp; Gaja, 1998).</td>
</tr>
<tr>
<td>Alstonia scholaris</td>
<td>HSI human sarcoma benzo(a)pyrene induced stomach carcinoma (Dhar et al., 1968; Jagetia, Baliga, &amp; Venkatesh, 2002).</td>
</tr>
<tr>
<td>Amura rohitaka</td>
<td>Leukaemia (Prasad &amp; Deshpande, 1968; Rabi &amp; Gupta, 1995).</td>
</tr>
<tr>
<td>Anacardium occidentale</td>
<td>Hepatoma 129 (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Asparagus racemosa</td>
<td>Human epidermoid carcinoma (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Bacopa monniera</td>
<td>Walker carcinosarcoma 256 (Bhakuni et al., 1969).</td>
</tr>
<tr>
<td>Berberis aristata</td>
<td>Human epidermal carcinoma of the Nasopharynx. N-nitrosodiethylamine induced carcinogenesis (Anis, Rajeshkumar &amp; Kuttan, 2001; Bhakuni et al., 1969).</td>
</tr>
<tr>
<td>Herb</td>
<td>Action/Indications</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Calotropis gigantea</td>
<td>Human epidermal carcinoma of the nasopharynx (Bhakuni et al., 1969; Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Curcuma longa</td>
<td>Fibrosarcoma, Preclinical and clinical trials review (Aggarwal et al., 2003; Sriganth &amp; Premalatha, 1999).</td>
</tr>
<tr>
<td>Datura metel</td>
<td>Human epidermal carcinoma of the nasopharynx (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Erythrina suberosa</td>
<td>Sarcoma 180 (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Euphorbia hirta</td>
<td>Freund virus leukaemia (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Gynandropis pentaphylla</td>
<td>Hepatoma 129 (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Hygrophila spinosa</td>
<td>Dalton’s lymphoma. Ehrlich ascites carcinoma and Sarcoma-180 (Maiti, 1994; Mazumdar, Gupta, Maiti, Mukherjee, 1997).</td>
</tr>
<tr>
<td>Ixora undulata</td>
<td>P-388 lymphocytic leukaemia (Dhawan, Dubey, Mehrotra, Rastogi, &amp; Tandon, 1980).</td>
</tr>
<tr>
<td>Juniperus indica</td>
<td>Human epidermoid carcinoma of the nasopharynx (Dhawan et al., 1980).</td>
</tr>
<tr>
<td>Luffa cylindrica</td>
<td>Schwartz leukaemia (Dhawan et al., 1980).</td>
</tr>
<tr>
<td>Melia azedarach</td>
<td>Walker carcinosarcoma 256 (Bhakuni et al., 1969).</td>
</tr>
<tr>
<td>Moringa oleifera</td>
<td>Human epidermoid lymphocytic leukaemia. Skin papillomagenesis (Bharali, Tabassum, &amp; Azad, 2003; Dhawan et al., 1980).</td>
</tr>
</tbody>
</table>
**Table 15**
*Herbs used in Ayurveda with proven anticancer properties*

<table>
<thead>
<tr>
<th>Herb</th>
<th>Action/Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nerium indicum</td>
<td>Erlish ascites carcinoma (Pal et al., 1968).</td>
</tr>
<tr>
<td>Ocimum sanctum</td>
<td>Skin and liver tumours (Dubey, 1997).</td>
</tr>
<tr>
<td>Paederia foetida</td>
<td>Human epidermoid carcinoma of the nasopharynx (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Picrorrhiza kurroa</td>
<td>Hepatic cancers (Dhar, M. L. et al., 1968).</td>
</tr>
<tr>
<td>Plumbago zeylanica</td>
<td>Hepatoma (Parimala &amp; Sachdanandam, 1993).</td>
</tr>
<tr>
<td>Rubia cordifolia</td>
<td>P-388, L-1210, B-16 melanoma, colon 388, Lewis lung carcinoma, mammary carcinoma (Itokawa et al., 1984).</td>
</tr>
<tr>
<td>Taxus buccata</td>
<td>Cytotoxic against various tumours (Mellado et al., 1984).</td>
</tr>
<tr>
<td>Vinca rosea</td>
<td>P-1534, carcinoma of the breast, cervix, kidney, lung and ovary (Rastogi &amp; Merhotra, 1993).</td>
</tr>
<tr>
<td>Withania somnifera</td>
<td>Various tumours (Dhar, M. L. et al., 1968).</td>
</tr>
</tbody>
</table>
Ayurvedic medicine in traditional times was well respected as a cogent, scientific organised discipline as evidenced by the translation of its texts into Greek (300BCE), Tibetan and Chinese (300CE), Persian and Arabic (700CE) and other Asian languages (Saxena, 2001, p. 49). The breadth of research in the above table demonstrates the development of this traditional Indian medicine into an integrative oncological therapy.

**CAM:** Including Naturopathy, Western Herbal Medicine, Functional Medicine and Homeopathy.

According to Micozzi (2007c, p. 294), “it is now well established that nutritional factors are an important hallmark in the pathogenesis… of cancer”. There are claims that there is significant research to support OM inclusion of naturopathic methods in the treatment and prevention of cancer (Collinge, 1996).
Table 16
Biological Compounds

<table>
<thead>
<tr>
<th>Compound</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIM / I3C</td>
<td>Gene Expression Profiles of I3C- and DIM-Treated PC3 Human Prostate Cancer Cells Determined by cDNA Microarray Analysis. I3C and DIM up-regulated the expression of genes that are related to the Phase I and Phase II enzymes, suggesting their increased capacity for detoxification of carcinogens or chemicals (Yiwei, Li, &amp; Sarkar 2003, p. 1012).</td>
</tr>
<tr>
<td>EGCG (epigallocatechin-3 gallocate)</td>
<td>Decreased c-fos and c-jun RNA transcripts, suggesting that activator protein (AP)-1–responsive regions present in the human VEGF promoter may be involved in the inhibitory effect of EGCG. Also suppressed the expression of protein kinase C, another VEGF transcription modulator, in breast cancer cells (Sartippou et al., 2002, p. 2307).</td>
</tr>
<tr>
<td>CURCUMIN QUERCETIN and other phytochemicals</td>
<td>These agents have been shown to suppress cancer cell proliferation, inhibit growth factor signalling pathways, induce apoptosis, inhibit NF-kB, AP-1 and JAK-STAT activation pathways, inhibit angiogenesis, suppress the expression of anti-apoptotic proteins, inhibit cyclooxygenase-2 (Dorai &amp; Aggarwal, 2004, p. 129). Curcumin exerts strong anti-invasive effects in vitro that are not oestrogen dependent in the ER-negative MDA-MB-231 breast cancer cells and inhibits the transcript levels of 2 major angiogenesis factors VEGF (vascular endothelial growth factor) and b-FGF (basic fibroblast growth factor) mainly in ER-negative MDA-MB-231 cells (Shao et al., 2001, p. 234). Quercetin inhibits the expression and function of the androgen receptor in LNCaP prostate cancer cells (Xing Chen, Mitchell, &amp; Young, 2001, p. 409).</td>
</tr>
<tr>
<td>INDIRUBIN</td>
<td>Indirubin, the active component of a traditional Chinese herbal medicine, has been shown previously to inhibit cyclin-dependent kinases, resulting in cell cycle arrest. Indirubin derivatives inhibit Stat3 signalling and induce apoptosis in human prostate cancer cells (Nam et al., 2005, p. 5998).</td>
</tr>
</tbody>
</table>
Compounds are extracted biological agents from food and/or herbs. Biological anti-tumour therapies explore biological agents for their direct or indirect anti-tumour activities. The increasing knowledge of tumour physiology, molecular and biological behaviour of tumours and immune escape mechanisms has stimulated the development of biologicals that interact with specific pathways and processes essential for tumour growth, or that increase in a (non)-specific way the anti-tumour immune reactivity (Gratama, Lamers, & Sleijfer, 2007).

SUPPLEMENTS

Many nutrients play a major role in cell health (Balducci et al, 1986). For example, several nutrients, such as vitamins B6 and B12, folate, choline, and methionine, are vital to DNA synthesis (Palmer, 1985). Several studies have shown that chronic deficiencies in these nutrients greatly increase the risk of developing cancer (Wainfan & Poirier, 1989). When folate is deficient in the diet, not only is it easier to induce cancers in animals, but also the deficiency causes the tumours to grow faster and act more aggressively (Pogribny et al., 1995). However, high serum folate levels were associated with the exacerbation of chemotherapy-induced decreases in neutrophil count (Branda, Naud, Brooks, Chen, & Muss, 2004). A 2007 polyp prevention study in patients with polyps published in the Journal of the American Medical Association (JAMA), showed that folate supplementation did not reduce risk of colorectal adenomas but rather increased risk of advanced and multiple adenomas at 6–8 years of follow-up, suggesting that undetected precursor lesions are more likely to progress with supplements (Cole et al., 2007).
Table 17
Supplements (food micro-nutrients)

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Effect Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VITAMIN D3</td>
<td>Three different human prostate carcinoma cell lines all possess specific Vit. D3 receptors and that 1,25(OH)2D3 treatment can elicit both an antiproliferative and a differentiating action on these cancer cells (Skowronski, Peehl, &amp; Feldman 1993).</td>
</tr>
<tr>
<td>VITAMIN E</td>
<td>Slightly reduces the risk of recurrence among breast cancer survivors (Fleischauer, Simonsen, &amp; Arab, 2003, pp. 15-16). Reduces the loss of white blood cells (neutropenia) that is associated with chemotherapy (Branda et al., 2004, p. 1060). Note: Avoid using when taking Tamoxifen (Peralta, Viegas, Louis, Engle, &amp; Dunnington, 2006, p. 607).</td>
</tr>
<tr>
<td>SELENIUM</td>
<td>Patients with a selenium level &lt;70 µg/l had a significantly lower mean survival time and a lower cumulative cancer-related survival rate than patients with a selenium level &gt;70 µg/l (P=0.0009) (Psathakis et al., 1998, p. 328).</td>
</tr>
<tr>
<td>VITAMIN A</td>
<td>Daily oral administration of high-dose vitamin A is effective in reducing the number of new primary tumours related to tobacco consumption and may improve the disease-free interval in patients curatively resected for stage I lung cancer (Pastorino et al., 1993, p. 1216).</td>
</tr>
</tbody>
</table>

A number of studies have been done on antioxidants and cytotoxic therapies. The most recent review in *The Journal of the National Cancer Institute* urges caution on their use (Bairati et al., 2005). In another study Lawenda et al. (2008, p. 773) state, “Controversy remains about the efficacy and safety of this complementary treatment. Several randomised clinical trials have demonstrated that the concurrent administration of antioxidants with chemotherapy or radiation therapy reduces treatment-related side effects”. They go on however to urge caution, stating that “the use of supplemental antioxidants during chemotherapy and radiation therapy should be discouraged because of the possibility of tumour protection and reduced survival” (Lawenda et al., p. 781).

However Moss, well-known author of several books on CAM and cancer including *Questioning Chemotherapy* (Moss, 1995), calls into question their research methods. He points out (Moss, 2008) that one of the main studies on the administration of synthetic beta-carotene and alpha-tocopherol during cancer treatment, called the Laval Study, was flawed.

In their study they found a reduction of 29% in local tumour control for the alpha tocopherol group and a 56% reduction in tumour control in the group that received both alpha tocopherol and beta-carotene (Bairati et al., 2005). Upon further analysis it was revealed that the harmful effect of these synthetic vitamins was entirely restricted to one group —smokers. And not just smokers, but those who smoked through the course of their radiation therapy, and all other groups appeared to be unharmed by the interaction (Moss, 2008).

In another study of breast cancer patients it was shown that patients using antioxidants are less likely to suffer a recurrence or die from their cancer (Fleischauer et al., 2003).

In a review of four common antioxidants it was found they might provide some benefit when combined with certain types of chemotherapy. Despite the fact that chemotherapy-induced formation of free radicals is well-demonstrated, chemotherapy-induced cytotoxicity in general does not seem to depend on formation of reactive oxygen species (Drisko, Chapman, & Hunter, 2003). Recent journal reviews of the use of vitamin C and other nutritional supplements have generally cited a positive therapeutic effect on people, when given in conjunction with chemotherapy, along with increased survival and Vitamin C antagonises the cytotoxic effects of antineoplastic drugs (Heaney et al., 2008).
But from another study on the effect of vitamin C on viability, clonogenicity, apoptosis, P-glycoprotein, reactive oxygen species (ROS), and mitochondrial membrane potential support the hypothesis that vitamin C supplementation during cancer treatment may detrimentally affect therapeutic response (Heaney et al., 2008).

The contradictory research suggests caution in the use of antioxidant supplements but not the use of foods or herbs, which contain antioxidants as part of their molecular structure. It has yet to be demonstrated if food based compounds/agents such as resveratrol or EGCG ((-)epigallocatechin-3-gallate) have a similar impact on the therapeutic response to cytotoxic therapies.

HOMEOPATHY

In a study done in Virginia in the US it was found there was a 23% reduction in tumour incidence (P < .0001), and for animals with tumours, there was a 38% reduction in tumour volume in homeopathy-treated animals versus controls (P < .02) (Jonas et al., 2006, p. 343). At time of killing, experimental animals with tumours had a 13% lower average tumour weight (P < .05). Tumours in these homeopathic treated animals showed a 19% increase in apoptotic cell death (P < .05) and reduced PCNA-positive cells (Jonas et al., 2006).

The fact that there is no known mechanism by which extremely dilute homeopathic medications should be able to exert a biological effect should be a source of concern to proponents of homeopathy and if the proposed mechanisms can be shown to be insupportable, the Director of the Office of Alternative Medicine of the US National Institutes of Health has suggested that it is highly speculative and imaginary explanations may be necessary to justify the claims made (Jonas, Kaptchuk, & Linde, 2003). But a response by Jonas, of Uniformed Services University of the Health Sciences in Maryland, points out this is a methodological solution to what is clearly a debate about belief and not methodology (Jonas, 2000). He goes on to say that what is needed in homeopathy is a set of reasonable, testable theories that can even partially explain both the positive and negative results. This may require a theory that incorporates subjective variables that are normally shunned in ‘hard’ science (Jonas, 2000).

In the journal Homeopathy, van Wijk and Albrecht reported findings of 1500 trials performed on homeopathic potencies diluted beyond Avagadro’s number, of which 60% were effective (van Wijk & Albrecht, 2007).

In a study published in the Journal of Alternative Medicine comparing homeopathy with placebo in 53 breast cancer survivors with oestrogen withdrawal symptoms, it was found there were no significant differences between the ex-
experimental and the placebo group (Thompson, Montgomery, & Douglas, 2005)

DISCUSSION

There are two different human methodologies of knowing: one is time oriented, and the other is space oriented (Liu, 2005). This analysis of the differences between Chinese medicine and modern science by the contemporary philosopher Liu Changlin (Liu, 2005) goes on to describe how Chinese medicine is time therapy, based in the ancient science of energy dynamics, while Western medicine is space therapy, rooted in the modern science of matter analysis (Fruehauf, 2006). Leder, from the Department of Philosophy at Loyola College, argues that clinical medicine (CM) can best be understood not as a purified science but as a hermeneutical enterprise, as involved with the interpretation of texts (Leder, 1990). He discusses four textual forms regarding CM: the experiential text of illness as lived out by the patient; the narrative text constituted during history taking; the physical text of the patient’s body as objectively examined; and the instrumental text constructed by diagnostic technologies. In seeking to escape from all interpretive subjectivity, “medicine has threatened to expunge its primary subject - the living, experiencing patient” (Leder, 1990, p. 14). Leder concludes, “Modern medicine needs to awaken from its dream of a purified objectivity” (p. 19).

Using models of semiotics, Baglia (2008) pointed out how the processes of signification – meaning-making – are operating simultaneously and independently during doctor/patient interaction, ultimately obfuscating an efficacious diagnosis.

Current orthodox medical treatment lays its main emphasis on evidence-based medicine (EBM) and quantifying the effects of treatment statistically assesses cure. In contrast, in Chinese medicine, cure is generally assessed by evaluating the patient’s pattern (Zheng) and medicines are prescribed accordingly, and TCM cannot be evaluated precisely according to Western principles, in which a constant amount of the same medicine is given to a group of patients to be evaluated. When assessing cure, using TCM, Zheng is more important than the determination of medical effects. This means that quantitative evaluation of TCM treatment can be very difficult (Seki et al., 2005).
References


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sum. *Life Sciences, 72*(16), 1851-1858.
2024-2032.


Psathakis, D., Wedemeyer, N., Oevermann, E., Krug, F., Siegers, C. P., & Bruch,


CHAPTER 5

COMPOUNDS AND EXTRACTS FOR USE WITH CHEMOTHERAPY AND RADIOTHERAPY

Compounds and Extracts for use with Chemotherapy................................. 106
Compounds and Extracts for use with Radiotherapy............................... 109
Chemotherapeutic Agents Further Information...................................... 113
Selenium
In addition to their cancer-preventive potential, selenium supplements may enhance the effectiveness of conventional chemotherapy treatment (Vadgama et al, 2000) and improve quality of life for patients undergoing radiation therapy (Hehr et al, 1997).

Vitamin C
Vitamin C both at non-cytotoxic (1 microM) and moderately cytotoxic concentrations (10(2) microM) improved the cytotoxicity of doxorubicin (DOX), cisplatin (DDP), and paclitaxel (Tx) significantly. Combination effects between Vit C and DDP or Tx were partly synergistic and partly additive or sub-additive whereas a consistent synergism was found between Vit C and DOX. The mechanisms by which Vit C potentiates the cytostatics studied are yet unclear and should be evaluated further (Kurbacher, 1996).

Vitamin D3
Data suggest that pre-treatment of breast cancer with 1,25(OH) 2D3 or all-trans-retinoic acid (ATRA) lowers the threshold for cell killing by chemotherapy agents and may provide a novel treatment option for this disease (Somassundaram, 2000).

Grape Seed Extract
Grape seed extract (GSE) plus doxorubicin (DOX) combination showed a very strong and significant G1 arrest in MDA-MB468 cells when compared with DOX alone, however, it was less than that observed with GSE alone. In quantitative apoptosis studies, GSE and DOX alone and in combination showed comparable apoptotic death of MCF-7 cells, however, a combination of the two was inhibitory to DOX induced apoptosis in MDA-MB468 cells. This was further confirmed in another oestrogen receptor-negative MDA-MB231 cell line, in which GSE and Dox combination strongly inhibited cell growth but did not show any increase in apoptotic cell death caused by Dox. Together, these results suggest a strong possibility of synergistic efficacy of GSE and Dox combination for breast cancer treatment, independent of oestrogen receptor status of the cancer cell (Sharma, 2004).

Ginseng, Alcohol Extracted
Multi-drug resistance (MDR) is a major problem in cancer chemotherapy and has often ended up with termination of the therapy. The aim of this study was to identify any fractions of Korean red ginseng that would be effective in modulating for MDR. Although ginsenosides have been reviewed as possible
MDR modulators, the MDR modulation activity of the other component is unknown. Therefore, a red ginseng was extracted with methanol, ether, ethylacetate, and n-butanol, followed by several fractionations by silica gel chromatography. And the activity of MDR modulating for these fractions was examined via sulforhodamine B assay. We have found that several ether fractions, as non-saponin components are effective on MDR modulation. We expect that these results will be helpful to the improvement of cancer chemotherapy (Shin et al, 2007).

**CoQ10**
CoQ10 protected against cardiac toxicity associated with anthracycline treatment in patients with malignancy. In one study, children with acute lymphoblastic leukaemia or non-Hodgkin’s lymphoma who received CoQ10 (1.00 mg/d) with daunorubicin exhibited significantly fewer signs of cardiac dysfunction compared to treatment with daunorubicin alone. Mice treated with a combination of doxorubicin and CoQ10 survived significantly longer [224.1 %] than controls; the optimum protective effect was achieved with oral doses of 10 mg/kg/day. The CoQ10 group had significantly less liver and heart microsomal lipid peroxidation, a potential indicator of cardiac toxicity. CoQ10 does not affect the pharmacokinetics of doxorubicin (Iarussia et al, 1994).

**Alpha-Lipoic Acid**
A study comparing alpha-Lipoic acid at several different doses (25-100 mg/kg), with and without cisplatin, concluded that the alpha-Lipoic acid conferred significant protection against cisplatin toxicity at all dose levels in rats. This effect was associated with improvements in glutathione metabolic markers and reduced oxidative stress (Rybak et al, 1999).

**Silibinin**
In quantitative apoptosis studies, combination of silibinin with doxorubicin (Dox) resulted in much stronger apoptotic death compared to each agent alone in both cell lines. In case of silibinin combination with cisplatin, it showed no additional apoptotic effect in either cell line. Similarly, silibinin plus carboplatin combination showed stronger apoptotic effect only in MCF-7 cells. Together, these results suggest a possible synergism between silibinin and conventional cytotoxic agents for breast cancer treatment, and warrant further in vivo studies in pre-clinical breast cancer models (Tyagi et al, 2004).

Note: May affect the elimination of drugs, which undergo glucuronidation as part of their metabolism (Kivisto et al, 1995; NMCD, 2004).

Silibinin increases mitoxantrone’s efficacy, reducing cell viability in a synergistic manner. The CI values were 0.515-0.929, 0.521-0.967, and 0.413-2.650 for
the combination of silibinin and mitoxantrone in DU145, LNCaP, and PC-3 cells, respectively. The combination of docetaxel and silibinin showed only modest synergy for some conditions with CI values of 0.898-2.544, 0.921-2.32, and 0.895-4.469, respectively, for cell lines DU145, LNCaP and PC-3. Conclusions: The combination of silibinin and mitoxantrone exhibits significant synergy in reducing cell viability. These data are important in the planning of future clinical applications of silibinin and contribute to our understanding of silibinin’s mechanism of action (Prostate Cancer Symposium, 2006).

Administration of cisplatin caused a decline in kidney function within a day following treatment. Symptoms observed were for example decreases in creatinine clearance and increases in proteinuria, in the urinary activity of the proximal tubular enzymes alanine aminopeptidase and N-acetyl-β-D-glucosaminidase and in renal magnesium wasting. The effects of cisplatin on creatinine clearance and proteinuria were totally prevented by a pre-treatment of the animals with silibinin. Impairment of proximal tubular function was ameliorated, that is enzymuria and magnesium wasting was less pronounced. Silibinin alone had no effect on kidney function. Treatment with silibinin distinctly diminished morphological alterations observed in the S3-segment of the proximal tubule 4 days after cisplatin administration. The effects of cisplatin on glomerular and proximal tubular function as well as proximal tubular morphology could totally or partly be ameliorated by silibinin. It is concluded that silibinin can act as a nephroprotectant and it is suggested that it could have beneficial effects on the kidney in clinical settings (Gaedeke et al 1996).

**Indirubin**

Indirubin can enhance cisplatin accumulation in an ovarian cancer cell lines (Blagosklonny, 2002).

**Andrographalide**

Andrographalide (AG) aids multidrug-resistant colorectal cancer cell lines. Remarkable inhibitory and apoptosis rate was shown when AG was co-administered with 5-FU, ADM and DDP, respectively. Interestingly AG alone could not induce apoptosis and change the cell cycles. AG might affect the expression of P-170, which was indicated by rhodamine staining (Han et al, 2005).

**Melatonin**

Melatonin (MLT) has been proven to counteract chemotherapy toxicity, by acting as an anti-oxidant agent, and to promote apoptosis of cancer cells, so enhancing chemotherapy cytotoxicity. The study included 250 metastatic solid tumour patients (lung cancer, 104; breast cancer, 77; gastrointestinal tract neoplasms, 42; head and neck cancers, 27), who were randomised to receive MLT (20 mg/day orally every day) plus chemotherapy, or chemotherapy alone. Che-
motherapy consisted of cisplatin (CDDP) plus etoposide or gemcitabine alone for lung cancer, doxorubicin alone, mitoxantrone alone or paclitaxel alone for breast cancer, 5-FU plus folinic acid for gastro-intestinal tumours and 5-FU plus CDDP for head and neck cancers. The 1-year survival rate and the objective tumour regression rate were significantly higher in patients concomitantly treated with MLT than in those who received chemotherapy (CT) alone (tumour response rate: 42/124 CT+MLT versus 19/126 CT only, P<0.001; 1-year survival: 63/124 CT+MLT versus 29/126 CT only, P<0.001). Moreover, the concomitant administration of MLT significantly reduced the frequency of thrombocytopenia, neurotoxicity, cardiotoxicity, stomatitis and asthenia. This study indicates that the pineal hormone MLT may enhance the efficacy of chemotherapy and reduce its toxicity, at least in advanced cancer patients of poor clinical status (Lissoni, 1999).

**COMPOUNDS AND EXTRACTS FOR USE WITH RADIOTherAPY**

**Vitamin A / Retinol**
These findings suggest that supplemental vitamin A may reduce lung inflammation after thoracic radiation and be an important modifiable radio-protective agent in the lung (Redlich, 1998).
Retinol palmitate significantly reduced rectal symptoms of radiation proctopathy, perhaps because of wound-healing effects. The current results can serve as the foundation for future trials examining retinol palmitate in the multi-institutional setting (Eli, 2005).

**Shark Liver Oil**
Studies over the last 30 years have shown that alkylglycerols are multifunctional. The level of natural alkylglycerols rises within tumour cells, apparently in an effort to control cell growth. Recent studies indicate that the activation of protein kinase C, an essential step in cell proliferation, can be inhibited by Alkylglycerols and to prevent radiation sickness from cancer x-ray therapy. This action suggests a competitive inhibition of 1,2-diacylglycerol by alkylglycerols. Further studies on the immunostimulatory action of alkylglycerols suggest a primary action on the macrophage. The process of macrophage activation has been demonstrated with both synthetic and natural alkylglycerols. While the exact mechanism has not been found, both an autocrine and paracrine systems have been suggested. Shark liver oil is a major natural source of alkylglycerols, which have no known side effects in dosages of 100 mg three times a day. The information presented in this article suggests that alkylglycerols may be used both as an adjunct therapy in the treatment of neoplastic disorders and as an immune booster in infectious diseases (Pugliese et al, 1998).
Note: has an effect on warfarin, aspirin and non-steroidal anti-inflammatory
Effect of Alkylglycerols following Radiation Therapy

Grade 1: Injuries producing mild subjective symptoms accompanied by minimal objective changes to the mucosa.

Grade 2: Injuries, which are composed of moderately severe objective changes, such as areas of necrosis, ulcers or moderate stenosis.

Grade 3: Bladder and urethra injuries comprising fistulas and rectal and intestinal injuries comprising stenosis that require colostomy.

Grade 4: Rectal and intestinal fistulas

Table 18
Effect of Alkylglycerols following Radiation

<table>
<thead>
<tr>
<th></th>
<th>No. of patients</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation only</td>
<td>648</td>
<td>24.1%</td>
<td>7.1%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Alkylglycerols only</td>
<td>380</td>
<td>12.6%</td>
<td>7.6%</td>
<td>4.2%</td>
</tr>
<tr>
<td>only during radiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkylglycerols</td>
<td>454</td>
<td>9%</td>
<td>5.7%</td>
<td>3.5%</td>
</tr>
<tr>
<td>prior to &amp; during radiation</td>
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</tr>
</tbody>
</table>

(L-Glutamine, 1994).

L-Glutamine

L-glutamine, an amino acid and its recommended dose is 10 grams two to three times daily to help reduce gastrointestinal or oesophageal damage from thoracic or abdominal radiation exposure. Glutamine is in the most abundant naturally occurring, non-essential amino acid in the human body. It is normally found circulating in the blood and is also stored in the skeletal muscles. But in times of illness or injury glutamine becomes even more important. Radiation appears to be just such a time (Bauman, 2008).

Curcumin

Curcumin at 1.5 to 3 grams daily (in its 90 percent standardized form) can help protect the skin and other organs from radiation injury, which tends to accumulate towards the last days of treatment. Curcumin provides more gen-
eralized anti-inflammatory benefits, which counter some of the tissue damage that occurs with treatment. It also has tumour blood vessel growth inhibition (antiangiogenic) benefits, and can promote tissue oxygenation, which can promote the effectiveness of radiation (radiation is more effective in tissues that are well-oxygenated). In laboratory experiments, mice exposed to acute doses of whole body radiation developed thymic lymphoma, a kind of cancer, after three to four weeks of exposure. However, mice given antioxidants after they had been exposed to radiation experienced a significant decrease in thymic lymphoma (TL) incidence. There was a 20 percent prevention of TL in animals fed ascorbic acid (vitamin C) and eugenol (oil of cloves). But the reduction was 55 percent in animals fed with curcumin (Dange, 2007).

**Probiotics**
Probiotics, 1 to 2 capsules twice daily, which can be increased to 2 to 3 capsules twice daily. This should provide at least 5-10 billion colony-forming units (CFUs) of live lactobacillus, etc., to maintain healthy levels of intestinal flora. It also helps counter intestinal injury from radiation, which can otherwise disrupt healthy microflora and the mucosal integrity of the gut wall. CAVEAT: It is important to check with a physician before taking probiotics if there is an abdominal cancer or abdominal radiation treatment. In patients with pancreatitis, or in those whose gastrointestinal tract is otherwise compromised, there may be danger of probiotic ‘overgrowth’ leading to severe gastrointestinal complications (Besselink, 2008).

**Alpha-Lipoic Acid**
Alpha-lipoic acid (ALA), 25-50 mg twice daily, for antioxidant support. This is being explored by NASA as a way of preventing astronauts from suffering radiation damage. According to a 2008 Japanese study, “alpha-lipoic acid pretreatment exerted a very high magnitude of protection against radiation-induced augmentation of DNA damage” (Manda, 2008).

**Resveratrol**
Resveratrol 50 to 200 mg daily, to help decrease inflammation and for its antioxidant effects. A 2008 review from the University of Wisconsin showed that “resveratrol can act as a sensitizer to enhance the therapeutic effects of ionizing radiation against cancer cells” (Reagan-Shaw, 2008).

**SOD (superoxide dismutase)**
There are also natural antioxidants as well as other nutritional agents sold over-the-counter for the promotion of health that can have a beneficial effect during radiation therapy. Most prominent of these is copper/zinc (Cu/Zn) superoxide dismutase, or SOD. This stands out in terms of its ability to protect
against radiation damage. SOD is normally produced within the human body, but in supplemental quantities it has shown considerable promise in reducing both early and late radiation-induced tissue damage. In one clinical trial, 448 patients with bladder cancer were randomly assigned to receive either SOD (also called orgotein) or a placebo after each radiation treatment. Those who received SOD had fewer rectal problems and less bladder inflammation and skin toxicity than those who received the placebo (Sanchiz, 1998).

**Coenzyme Q10**
Coenzyme Q10 (CoQ10 or ubiquinone), 100-200 mg at bedtime, for antioxidant and immune activity. Co Q10 has been shown to decrease the cardiotoxicity of some chemotherapeutic drugs, and may do so with radiotherapy and chemoradiation as well (Hodges et al 1999).

**DIM/I3C**
DIM/I3C may help prevent DNA or genetic damage. Studies have shown that the genes Chk1 and Chk2 are activated in response to DNA damage by, among other things, ionizing radiation (Bonnesen, Eggleston & Hayes 2001).

**EGCG (Epigallocatechin Gallate)**
EGCG may increase tumour oxygenation and thus boost the tissue sensitivity to radiation therapy. A study of 60 patients carried out at the University of California at Los Angeles (UCLA) showed that “tea extracts are an efficient, broadly available treatment option for patients suffering from acute radiation-induced skin toxicity” (Pajonk, 2006). Other forms of radiation-induced toxicity might also respond.

**Digestive Enzymes**
Researchers found a statistically significant reduction in symptoms such as mucositis, dysphagia and skin reaction associated with radiotherapy. In addition, the number of patients progressing toward moderate and severe reactions was less in the test group compared to the control group (Gujral, 2001). Oral enzymes act as potent anti-inflammatory and anti-oedema agents. In addition to enzymes effects on mouth sores and dysphagia, researchers also found a statistically significant reduction in the number of patients experiencing skin reactions associated with radiotherapy. The number of patients progressing toward moderate and severe reactions was less in the test group compared to the control group (Gujral, 2001).

**Silybum marianum**
There are several CAM products and procedures that support the liver in times of distress. The most prominent is milk thistle (Silybum marianum) in a stan-
A standardized extract, generally taken as 80 to 200 mg one to three times a day. This is an antioxidant and liver protectant. A highly concentrated extract of milk thistle called silybin is the major active flavonolignan in milk thistle (Saller, 2006).

**CHEMOTHERAPEUTIC AGENTS FURTHER INFORMATION**

The site and article on herbs and natural products has some useful information but is dated. It still suggests antioxidants are unhelpful when using chemotherapeutic interventions.

“Herbs and Natural Products With Potential to Increase Cancer Growth, Interfere With Cancer Treatments, or Increase Cancer Recurrence for Patients Who Have or Have Had Cancer: Common and Brand Names” (Montbriand, 2004).

Following is a list of commonly used chemotherapeutic drugs with the T-CAM compounds, which may be helpful in enhancing the effect of the chemo agent and/or overcome or lessen the adverse effects. It is not an exhaustive list but [http://www.chemocare.com/bio/](http://www.chemocare.com/bio/) has a list of all the agents in use with their propriety names and acronyms.
Table 19
Herbs, Compounds and Supplements in Chemotherapy

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
</tr>
</thead>
</table>
| Carboplatin (Hlubocky, 2007; WHO, 2002; Agus et al, 1999; Anon, 1980). | Vitamin C to support anticancer effects and to improve overall tolerance (Carr & Frei, 1999).  
Vitamin E miscible to support anticancer effect and to improve overall tolerance.  
Vitamin D3 to support anticancer effects (Trump et al, 2000).  
Silibinin to support anticancer effects, protect the liver, and help prevent kidney damage (Tyagi et al, 2004).  (See note under contraindications)  
Polysaccharides from the mushroom Agaricus blazei, Hericium erinaceus, Ganoderma lucidum or maitake D fraction to support immune function, specifically natural killer cells (NK cells).  
Alpha-lipoic acid to reduce nerve toxicity and protect hearing (Soman et al, 2000).  
Vitamin K (dietary sources only; not prudent to supplement with vitamin K1 but K2 is not contraindicated) to support anticancer effects and to help protect bone marrow (caution when taking warfarin or other blood thinner medication. | N-acetylcysteine could increase resistance to carboplatin (Kearns & Hall, 1998).  
L-glutathione could increase resistance to carboplatin (Bellincampi et al, 2001). |
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<th>Drugs</th>
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<tbody>
<tr>
<td>Cisplatin / Docetaxel</td>
<td>Research from University of Tubingen, School of Medicine in Germany examined the modulation of drug-induced cytotoxicity and clonogenic cell death of glioma cells by three structurally unrelated antioxidants</td>
<td>Black Cohosh may decrease the effectiveness of cisplatin (Roller &amp; Weller, 2005). N-acetylcysteine may interfere with the anticancer action of cisplatin (Ferrari et al, 1995). Silibinin should be used with caution, as it may</td>
</tr>
<tr>
<td></td>
<td>Vitamin E to reduce toxicity to nerves and support anticancer effects (el Daly, 1998; Pace et al, 2003).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vitamin D3 to increase anticancer effect (Benjamin et al 1997).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protective effects of vitamin C against cisplatin-induced nephrotoxicity (Greggi, 2000).</td>
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<tr>
<td>revealed that these antioxidants inhibit acute cytotoxicity and clonogenic cell death induced by cisplatin. However, they had little effect on the toxicity of other cancer drugs including BCNU, doxorubicin, vincristine, cytarabine, or camptothecin. Antioxidants specifically inhibit cisplatin cytotoxicity of human malignant glioma cells (Roller &amp; Weller, 1998).</td>
<td>High dose of Vitamin B complex including B6 (above 300mg daily) may help prevent peripheral neuropathy while not interfering with the efficacy of cisplatin. Melatonin to enhance anticancer effect while improving overall tolerance (Lopez-Gonzalez, 2000). Cisplatin-induced renal toxicity: possible reversal by N-acetylcysteine treatment (Saad et al, 1997). Magnesium to reduce damage to nerves and kidneys; may also help with fatigue (Lajer &amp; Daugaard, 1999). Ginkgo biloba to reduce damage to nerves and kidneys (See contraindications) (Fukaya &amp; Kanno, 1999). Polysaccharide-K (PSK; from the fungus Coriolus versicolor) to reduce kidney damage (Kobayashi et al, 1994). Silibinin to reduce kidney damage. There are studies looking at the protective role of silibinin on the liver when taking certain chemotherapeutic medications as cisplatin, acetaminophen and vincristine (Gaedeke et al, 1996). Alpha Lipoic Acid protection against cisplatin-induced nephrotoxicity (Somani et al, 2000; Rock &amp; DeMichele, 2003).</td>
<td>interact with other medications prescribed before, during, and after chemotherapy. Note: May affect the elimination of drugs, which undergo glucuronidation as part of their metabolism (Kivisto et al, 1995; NMCD, 2004)</td>
</tr>
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</table>
### Herbs, Compounds and Supplements in Chemotherapy

<table>
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<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
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<tbody>
<tr>
<td>Cyclophosphamide</td>
<td>Astragalus to help increase white blood cell counts (Chu et al, 1988). Withania somnifera to help prevent decrease in blood cell counts (Davis &amp; Kuttan, 1998). Polysaccharide-K (PSK; from the fungus Coriolus versicolor) to help prevent decrease in blood cell counts. Melatonin to support anticancer actions and reduce side effects (Lissoni et al, 1997).</td>
<td>Curcumin may interfere with antitumour activity of cyclophosphamide (Somasundaram et al, 2002).</td>
</tr>
<tr>
<td>Drugs</td>
<td>Helpful nutrients and herbs</td>
<td>Contraindicated</td>
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<td>----------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Etoposide</td>
<td>Vitamin E may increase anticancer activity (Argyriou et al, 2003). Vitamin C may increase anticancer activity (Kagan et al, 1999).</td>
<td>Avoid herbs during etoposide therapy because many herbs may interfere with conversion of etoposide into its active form in the liver. Vitamin K1 may reduce effectiveness (Ichinose et al, 2000).</td>
</tr>
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</table>
Table 19
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<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
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<tbody>
<tr>
<td>5-FU, Fluouracil, Floxuridine, Capcetbine</td>
<td>Melatonin may improve tolerance to treatment (Kajdaniuk et al, 2001). (See contraindications)&lt;br&gt;Fish oil to support anticancer actions and reduces side effects.&lt;br&gt;Retinoid augmented the membrane permeability of anti-cancer drugs such as 5-FU, and reduced the exocytosis of anti-cancer drugs by suppressing the expression of the transport protein cMOAT. Retinoid also suppressed the invasive growth of the cancer cells (Yamamoto, 2001).&lt;br&gt;In Vitro, glutamine reduced the frequency of doxorubicin-induced chromosomal aberrations. In rats, treatment with glutamine before and during doxorubicin administration diminished the cardiotoxic effects of the drug by up-regulating glutathione synthesis in the heart.&lt;br&gt;Polysaccharide-K (PSK; from the fungus Coriolus versicolor) to increase response to treatment.&lt;br&gt;Curcumin to support anticancer actions (Du et al, 2006).&lt;br&gt;EGCG to support anticancer actions and reduce side effects (Hwang et al, 2007).</td>
<td>A study indicates that 5-FU–melatonin should be handled with care for treatment of oestrogen sensitive-breast cancer (as there is an agonist effect). (Furuya et al, 1994).&lt;br&gt;Beta-carotene may interfere with fluorouracil.&lt;br&gt;Probiotics should not be taken if white blood cell counts are low (less than 2.5) because of the risk of probiotic bacteria becoming a source of infection.</td>
</tr>
</tbody>
</table>
## Table 19

**Herbs, Compounds and Supplements in Chemotherapy**

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
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<tbody>
<tr>
<td>Lentinan</td>
<td>Lentinan to support anticancer actions and help preserve white blood cell count and function (Takatsuki et al, 1996). Probiotics to help prevent digestive tract toxicity (See contraindications). Panax notoginseng can enhance the anti-proliferation effect of 5-FU on HCT-116 human colorectal cancer cells and may decrease the dosage of 5-FU needed for colorectal cancer treatment.</td>
<td></td>
</tr>
<tr>
<td>Gemcitabine</td>
<td>Melatonin to support anticancer actions, support blood cell counts, and reduce side effects (Lissoni, 2002). Scutellaria barbata - ban zhi lian is a Gemcitabine agonist (Yina et al, 2004). Alpha lipoic Acid 2000 ASCO Annual Meeting Silibinin (Greenlee et al, 2007).</td>
<td>None Known</td>
</tr>
</tbody>
</table>
Table 19
*Herbs, Compounds and Supplements in Chemotherapy*

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ifosfamide</td>
<td>See below in TCM herbs for diarrhoea. Vitamin C protects kidney function in high doses of ifosfamide (Falkson et al, 1982). L-carnitine to help reduce fatigue and toxicity to nerves (numbness and tingling). Magnesium protects renal function (Koch et al, 1998). Silibinin (Bokemeyer et al, 1996).</td>
<td>n-acetylcysteine and L-glutathione may decrease anticancer effects of ifosfamide (Dirven et al, 1995). However, n-acetylcysteine has been used in combination with ifosfamide un-resectable pancreatic adenocarcinoma and refractory testicular cancer. (Loehr et al, 1983).</td>
</tr>
<tr>
<td>Irinotecan</td>
<td>DHA and EPA Essential Fatty Acids (EFAs) reduce side effects (Hardman, 2002). Melatonin to support anticancer actions (Mills et al, 2005).</td>
<td>Avoid herbs during irinotecan therapy because many herbs may interfere with conversion of irinotecan into its active form in the liver.</td>
</tr>
</tbody>
</table>
### Table 19

**Herbs, Compounds and Supplements in Chemotherapy**

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<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
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<tbody>
<tr>
<td>Polysaccharide-K (PSK; from the fungus Coriolus versicolor) to reduce side effects and increase anticancer actions.</td>
<td>St. John’s wort interferes with irinotecan (Mathijssen et al, 2002).</td>
<td></td>
</tr>
<tr>
<td>Theanine to increase anticancer actions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Treatment with Genistein and methotrexate uptake was decreased by nearly 50% and the cells were protected from methotrexate cytotoxicity (Xuan et al, 1998).</td>
<td>High dose Vitamin C: acute renal failure in combination with methotrexate (Werneke et al, 2004).</td>
</tr>
<tr>
<td>DHA and EPA EFAs reduce side effects (Hardman, 2002).</td>
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</tr>
<tr>
<td>Vitamin A deficiency exacerbates Methotrexate-induced jejunal injury (Warden et al, 1997).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic acid (dietary sources only; not to be supplemented unless so advised by a physician but the 5-Methyltetrahydrofolate form is superior) may protect against digestive tract toxicity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drugs</strong></td>
<td><strong>Helpful nutrients and herbs</strong></td>
<td><strong>Contraindicated</strong></td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Paclitaxel, (Taxanes)</td>
<td>L-glutamine to help overcome drug resistance (Vanhoef er et al, 1997).</td>
<td>Avoid herbs during paclitaxel therapy because many herbs may interfere with conversion of paclitaxel into its active form in the liver (Beijnen &amp; Schellens, 2004). However, Evodiae fructus may act as an agonist in Raf-1 activation (Blagosklonny, 1996). Quercetin may interfere with the anticancer activity of Taxanes (Marone et al, 2001).</td>
</tr>
<tr>
<td>Garlic, garlic extracts, Gingko, echinacea and ginseng all inhibit the pathway and have herb-cytotoxic interactions. Some caution around grape seed extract.</td>
<td>Melatonin to increase anticancer actions and reduce side effects (Lissoni, 1999). Effects of gamma-linolenic acid and oleic acid on paclitaxel cytotoxicity in human breast cancer cells (Menéndez et al, 2001). DHA and EPA EFAs reduce side effects (Hardman, 2002). Ascorbic acid (vitamin C) improves the anti-neoplastic activity of doxorubicin, cisplatin, and paclitaxel in human breast carcinoma cells (Kurbacher, 1996).</td>
<td></td>
</tr>
</tbody>
</table>
### Table 19
Herbs, Compounds and Supplements in Chemotherapy

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Helpful nutrients and herbs</th>
<th>Contraindicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topotecan</td>
<td>Genistein may increase anticancer effect, however soy should be avoided as a supplement in women with ovarian or other oestrogen receptor positive cancers (Gercel-Taylor et al, 2004). Baicalein Cancer (Miki et al, 2002). Melatonin (Lissoni et al, 1997)</td>
<td>None known</td>
</tr>
<tr>
<td>Vinblastine</td>
<td>Vitamin E may delay or decrease resistance to chemotherapy. Carnosol increases the intracellular accumulation of commonly used chemotherapeutic agents, including doxorubicin (DOX) and vinblastine (VIN), in drug-resistant MCF-7 human breast cancer cells which express Pgp (Lissoni, 1999). Retinol and vitamins E, B1 and B6 fell during Vinblastine treatment (Atukorala et al, 1983). Rh2 inhibited cell growth by G1 arrest at low concentrations and induced apoptosis at high concentrations in a variety of tumour-cell lines, possibly through activation of caspases. Rh2 possesses strong tumour-inhibiting properties, and potentially can be used in treatments for multidrug-resistant cancers, especially when it is used in combination with conventional chemotherapy agents (Jia et al, 2004).</td>
<td></td>
</tr>
<tr>
<td>Drugs</td>
<td>Helpful nutrients and herbs</td>
<td>Contraindicated</td>
</tr>
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<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Vincristine</td>
<td>Panax ginseng may delay or decrease resistance to chemotherapy (Choi et al, 2003). Vitamin C (sodium ascorbate) and Vitamin K3 may decrease resistance to chemotherapy (De Loecker et al, 1993). Omega 3 increases anticancer effect (Lee et al, 2006). Effect of thiocystic acid (alpha-lipoic acid) on the chemotherapeutic efficacy of cyclophosphamide and vincristine sulfate (Berger et al, 1983).</td>
<td>None known</td>
</tr>
</tbody>
</table>
References


nephrotoxicity without compromising cisplatin or ifosfamide anti-tumour activity. *Br J Cancer*, 74(12), 2036-2041.


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Mantovani, G., Macciò, A., Massa, E., Mudu, M. C., Manca, G., Mulas, C.,


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Plouzek, C.A., Ciolino, H.P., Clarke, R., Yeh, G.C. (1999). Inhibition of P-

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CHAPTER 6

CHINESE HERBAL MEDICINE AND CHEMOTHERAPY/RADIOThERAPy

Adjunctive Treatment in Chemotherapy
and Radiotherapy with Chinese Medicine .............................................. 136
Chemotherapy and Radiotherapy Side Effects:
Single Herbs and Dui Yao ........................................................................... 142
Chemotherapy and Radiotherapy Side Effects:
Formulas, Research and References............................................................ 145
Zev Rosenberg, L.Ac, O.M.D states that Chinese herbal medicine regards the use of most chemotherapeutic agents and radiation as “Heat Toxins” that damage the Yin and Qi and such chemotherapy drugs as cisplatin lower sperm counts (weaken jing/essence), cause stomatitis (heart fire), diarrhoea (damage to Spleen Qi), hearing loss, and leucopoenia. In Chinese medical analysis, cisplatin will kill fast-growing cells, such as mucosa and intestinal lining as well as cancer cells, weaken Kidney Jing and Yang, weaken Spleen Yang, aggravate heart fire all at the same time (Rosenberg, Z. n.d.).

This shows the extreme effects of toxic substances on the body, which can cause damage to Yin, Yang, Qi and Blood, and cause extreme hot and cold reactions concurrently. In Chinese cancer hospitals, the use of chemotherapy and radiation are often combined with the use of herbal medicine to protect the body from damage and reduce the overall dosage of chemo or radio therapeutic interventions (Cohen, Tagliaferrin & Tripathy 2007).

**ADJUNCTIVE TREATMENT IN CHEMOTHERAPY AND RADIOTHERAPY WITH CHINESE MEDICINE**

**Fu Zheng Therapy**

‘Fu Zheng Therapy’ (FZT) is a form of traditional Chinese herbalism that literally means, “to restore normalcy and balance to the body.” It does not specifically treat any infection or disease state but helps rebuild the body’s resistance and innate strength so that it may more effectively contend with the manifestations of the disease and it enhances the immune system, improves digestion, and stimulates energy levels. Its use in chemotherapy regimes ensure adequate levels of red and white blood cells. In a study published in 2007 Prof Lin Hong Shen stated that FZT could significantly improve the clinical symptoms, increase weight and increase most quality of life (QOL) markers. He found in his 2001 study that life extension of two years against control with a reduced rate of metastasis was achieved in of non-small cell lung cancer using FZT (Shi & Shi 1992).

Correct the Qi (Zheng Qi) and Restore the Normalcy (Fu Zheng)

- Radix Panax ginseng (Ren Shen)
- Radix Codonopsis pilosula (Dang Shen)
- Radix Astragalus membranaceus (Huang Qi)
- Radix Angelica sinensis (Dang Gui)
- Radix Rehmannia glutinosa (Shu Di)
- Radix Polygoni multiflori (He Shou Wu)
- Gelatinum Corii Asini (E Jiao)
Ai Fu Kang (Ke Li) Formula

This prescription comes from an experiential formula of Doctor Zhang Renji. The formula supports Vital-qi and anti-cancer actions, and is used to treat lung cancer, stomach cancer, liver cancer and other malignant tumours.

Professor Zhang, student of the famous TCM doctor Shi Jinmo, has explored methods of treating cancers with TCM for over 50 years. In the recent years, Zhang diagnosed and treated 120,000 patients with various cancers, and developed “Renji Tumour-inhibiting Granules” based on his experiences of supporting the Vital-qi and activating anti-tumoural activities. The basis for developing Renji Tumour-inhibiting Granules derives from clinical application, and guided by the his idea of using anticancer Chinese herbal medicine, increasing immunity, killing cancer cells and restoring haematogenous function. Professor Zhang Renji further modified and improved his formula and the formula is now known as “Ai Fu Kang”.

The establishment of the treating principles, selection and combinations of drugs in Ai Fu Kang Granules are guided by TCM theory and based on numerous clinical experiences and modern research on treating various cancers by supporting the Vital-qi. Huang Di Nei Jin Su Wen (Inner Cannon of Yellow Emperor; Plain Questions) said: “The Vital-qi will be impaired where pathogenic factors gather together”. The occurrence of tumour, most of all, is closely related to the weakness of Vital-qi. Tumours, obvious excess syndromes of
pathogenic factors, usually are manifested as accumulation of Heat and Toxin, stagnation of qi and Blood, Phlegm and lumps. Weak Vital-qi and inability to resist the pathogenic factors will cause the lingering of pathogenic factors, and pathogenic factors will impair Vital-qi, and exhaust Essence and Blood so that Vital-qi will be even weaker.

It can be seen that weak Vital-qi and excess pathogenic factors are both the basic pathogenesis in the course of occurrence, development, proliferation and deterioration. Therefore, supporting the Vital-qi and removing pathogenic factors is inevitably the basic principle in treating tumours. The prescription of Ai Fu Kang Granules is on the basis of summarising numerous clinical cases treated with TCM differentiation and following above-mentioned principles. It organically combines the treating methods of supporting the Vital-qi and removing pathogenic factors; with properly used medicines of invigorating qi, nourishing yin and Blood and tonifying the Liver and Kidney, along with the function of clearing Heat, removing Toxin, activating Blood, removing Blood stasis, dissolving lumps (Shandong University of TCM).

**Ai Fu Kang Ingredients**

- **Radix Astragali membranacei** (Huang Qi)
- **Sporophore Ganoderma lucidum** (Ling Zhi)
- **Radix Angelicae sinensis** (Dang Gui)
- **Radix Rehmanniae glutinosae** (Shu Di)
- **Fructus Lycii** (Gou Qi Zi)
- **Fructus Ligustri lucidi** (Nu Zhen Zi)
- **Herba Hedyotiolis diffusae** (Bai Hua She She Cao)
- **Radix et Herba Salviae chinensis** (Shi Jian Chuan)
- **Herba Scutellariae barbatae** (Ban Zhi Lian)
- **Herba Lobeliae chinensis** (Ban Bian Lian)
- **Herba Solani nigri** (Long Kuì)
- **Herba Dutchesneae indicae** (She Mei)
- **Radix Ranunculi ternati** (Mao Zhua Cao)
- **Rhizoma Polygoni cuspis** (Hu Zhang)
- **Rhizoma Bistortae** (Quan Shen)
- **Fructus Polygoni orientalis** (Shui Hong Hua Zi)

(Shandong University of TCM)
Functions and indications

Invigorates qi, nourishes Blood, tonifies the Liver and Kidney, clears Heat, removes Toxin, removes Blood stasis, dissolves lumps. Increases immune functions, elevates WBC, inhibits the growth of cancer cells, has quite good synergistic action and attenuation on radiotherapy and chemotherapy. Mainly used in the treatment and rehabilitation of lung cancer, stomach cancer, liver cancer and other solid tumours.

Prescription explanation

In this formula, huang qi and ling zhi are combined to invigorate the Vital-qi, reinforce the Spleen, and strengthen the body, dang gui and shu di huang are used to nourish Blood and yin, gou qi zi and nu zhen zi can tonify the Liver and Kidney. In addition, the above medicines have the Vital-qi-supporting effect of invigorating qi; nourishing Blood, tonifying the Liver and Kidney, supplementing Essence and Marrow. The main drugs are assisted with bai hua she she cao, shi jian chua, ban zhi lian, ban bian lian, long kui, she mei and quan shen to clear Heat, remove Toxin, and remove accumulation of pathogenic Heat and cancer Toxin of tumours; adjuvant drugs include mao zhua cao, hu zhang, shui hong hua zi which can activate Blood, remove Blood stasis, dissolve lumps to remove or alleviate the Blood stasis and lumps in cancers and tumours. Thus, the assistant and adjuvant drugs have the effect of removing pathogenic factors and anticancer. The whole formula is a medicine that can support the Vital-qi, remove pathogenic factors, consolidate the constitution, resist cancers and remove lumps. It has the characteristics of combination of expectant and causal treatment, supporting the Vital-qi without causing Evil-lingering and removing pathogenic factors without impairing the Vital-qi.

Main Pharmacodynamic Tests

The pharmacodynamic research on Ai Fu Kang Granules includes 4 aspects: removing pathogenic factors (anti-tumour test in animals), supporting the Vital-qi (influence over the immune function of animals), synergic action on low dosage of cyclophosphane (10mg/kg), and attenuation on high dosage of cyclophosphane.

1. Experiments on tumour-inhibiting function of Ai Fu Kang Granules were carried out in mice with transplanted liver cancer and sarcoma S180. The results showed that both low and high dosages of the product had obvious inhibitory effects on above two solid tumours (P<0.01 compared with water
control group). The tumour-inhibiting rates of low dosage group on liver cancer and S180 were 39.14% and 49.16% respectively. The anti-tumour effect of high dosage group was obviously superior to that of Compound Tian Xian Capsule, which was used in the control group (P<0.05), and its tumour-inhibiting rate was similar to that of cyclophosphane (201ng/kg), but had no inhibitory effect on thymus gland.

2. Experiments on supporting the Vital-qi function of Ai Fu Kang Granules over the phagocytic function of reticuloendothelial system, SRBC-induced generation of haemolysin antibody in rats and body weight as well as survival time of tumour-bearing mice were studied respectively. The results showed that high and low dosage groups could both significantly improve the phagocytic function of reticuloendothelial system on carbon granule (P<0.01 compared with water control group), and the effects of both groups were superior to that of Ping Xiao Pian group, but similar to those of Zhen Qi Fu Zheng Granules and Compound Tian Xian Capsule; high dosage group could elevate the generation of SRBC-induced haemolysin IgM, and significantly prolong the survival time, and survival-time-prolonging rate was 17.70%. Both high and low dosages could obviously increase the body weight of tumour-bearing mice (P<0.01), and the effect was very obviously superior to that of Ping Xiao Pian.

3. Studies of synergic action and attenuation of Ai Fu Kang Granules on cyclophosphane were made. Synergic action experiments showed that high and low dosages of this product could both to varying degree increase the tumour-inhibiting effect of cyclophosphane (10mg/kg) on liver cancer in mice, and the synergic effect was very obvious (P<0.01), and the strength was equivalent to that of the positive control drug Compound Tian Xian Capsule. Attenuation experiment showed that high and low dosages of Ai Fu Kang Granules could both inhibit the blood-cell lowering effect of cyclophosphane in the peripheral blood, compared with cyclophosphane group, P value was less than 0.01, and the effect of high dosage was obviously superior to that of positive control drugs of Ping Xiao Pian (P<0.05) and Compound Tian Xian Capsule (P<0.01), the effect of low dosage was equivalent to that of Ping Xiao Pian. It’s also found that high dosage could significantly lower the inhibitory effect of cyclophosphane on thymus gland, and the effect was superior to those of Ping Xiao Pian (P<0.01) and Compound Tian Xian Capsule (P<0.05). The results showed that Ai Fu Kang Granules could relieve the toxicity of cyclophosphane, which inhibited marrow and the thymus gland.

(Examining and Approving Methods for New Drug and Revision and Supplementary Regulation on Parts of Related Chinese Medicine, Shandong University of TCM 1996).
Basic Radiotherapy Formula

Radiotherapy damages Yin, creates its own Heat Toxin. Radiotherapy is Hot in Nature and damages “Righteous” Qi.

- Herba Hedyotiolis diffusae (Bai Hua She She Cao)
- Radix Asparagi cochinchinensis (Tian Men Dong)
- Fructus Ligustri lucidi (Nu Zhen Zi)
- Sclerotium Poriae cocos (Fu Ling)
- Sclerotium Polypori umbellati (Zhu Ling)
- Rhizome Atractylodis macrocephalae (Bai Zhu)
- Herba Agrimoniae pilosae (Xian He Cao)
- Radix Curcumae venyujin (Yu Jin)
- Rhizoma Dioscoreae bulbiferae (Huang Yao Zi)
- Radix Astragali membranaceei (Huang Qi)
- Radix Pseudostellariae heterophyllae (Tai Zi Shen)
- Flos Lonicerae Japonicae (Jin Yin Hua)
- Radix Glycyrrhizae uralensis (Gan Cao)

(Zhang and Zhang, 2006; Cui, Li, Wan and Xu, 2006)

Basic Chemotherapy Formula

- Radix Ginseng (Ren Shen)
- Radix Codonopsis pilosulae (Dang Shen)
- Radix Astragali membranacei (Huang Qi)
- Radix Angelicae sinensis (Dang Gui)
- Radix Rehmanniae glutinosae (Shu Di Huang)
- Radix Polygoni multiflori (He Shou Wu)
- Gelatinum Corii asini (E Jiao)
- Fructus Lycii (Gou Qi Zi)
- Caulis Millettiae reticulatae (Ji Xue Teng)
- Tuber Ophiopogonis japonici (Mai Men Dong)
- Rhizoma Polygonati sibirici (Huang Jing)
- Herba Leonori heterophylli (Yi Mu Cao)
- Fructus Ligustri japonici (Nu Zhen Zi)
- Herba Dendrobii (Shi Hu)
- Folium Mori albae (Sang Shen)
- Herba Epimedii (Yin Yang Huo)
- Semen Cuscutae chinensis (Tu Si Zi)
- Fructus Psoraleae corylifoliae (Bu Gu Zhi)
- Cordyceps chinensis (Dong Chong Xia Cao)
Herba Cynomorii songarici (Suo Yang)
Fructus Alpiniae Oxyphyllae (Yi Yi Ren)
Radix Morindae officinalis (Ba ji Tian)
Cortex Eucommiae ulmoidis (Du Zhong)
Radix Salviae miltiorrhizae (Dan Shen)

(Huang et al, 2006)

Avoid use in formulations: Cassia cinnamon as it contains coumarins, which can cause hepatotoxicity in animal models. Lower amounts might cause liver problems in susceptible people, such as those with pre-existing liver disease. Theoretically, concomitant use with other potentially hepatotoxic drugs might increase the risk of developing liver damage (Felter et al 2006).

CHEMOTHERAPY AND RADIOTHERAPY SIDE EFFECTS: SINGLE HERBS AND DUI YAO

Stomachtitis Associated with Conventional Cancer Treatment
Flos Lonicerae Japonicae (Jin Yin Hua)

Three American experts on traditional Chinese medicine (Isaac Cohen, LAc, OMD, Mary Tagliaferri, MD, LAc & Debu Tripathy, MD) recommend a mixture of green tea (3 grams) plus Chinese honeysuckle (Flos Lonicerae Japonicae (Jin Yin Hua) 10 grams) for the treatment of stomachtitis associated with conventional cancer treatment. These two herbs are steeped in boiling water for 3 to 5 minutes and used as a mouth rinse (Cohen, Tagliaferrin & Tripathy, 2007).

Renal lesions caused by Cisplatin
Radix Astragali membranacei (Huang Qi)

Objective: To explore the protective effects of Huang Qi on renal lesions caused by chemo agents. Methods: Mouse model of renal lesions was established with single intraperitoneal injection of cisplatin at 7mg/kg. Huang Qi of different dosages was injected on the 1st to 7th day, and the blood urea nitrogen, creatinine and NAG enzyme as well as pathological changes of kidneys was observed.

Results: Huang Qi of different dosages could improve the abnormal changes of blood urea nitrogen, creatinine and NAG enzyme caused by cisplatin, and the improving degree was positively correlated to the dosage of Huang Qi. Pathological study showed that it could alleviate renal lesions.

Conclusion: Huang Qi could prevent and protect the renal toxicity caused by
chemotherapy and improve renal functions (Wenzhu et al, 2005).

**Leukopenia due to 5-Fu and Cisplatin**

*Berberine, isolated from Rhizoma Coptis chinensis (Huang Lian)*

**Objective:** To study the function of berberine treating nasopharyngeal carcinoma patients with leukopenia by radiotherapy (60Co) and chemotherapy (5-Fu and Cisplatin).

**Methods:** 165 patients with leukopenia due to radiotherapy and chemotherapy for nasopharyngeal carcinoma were randomly divided into two groups: 78 cases in the treated group (berberine) and 87 cases in the control group (Qing kailing injection, an injection made from herbs). The numbers of leukocyte was counted in both groups. **Results:** In improving WBC count, the markedly effective rates, effective rates and total effective rates were 43.59%, 48.72% and 87.62% in the treated group, and 18.39%, 33.33% and 49.43% in the control group. There were significant differences between the two groups. **Conclusion:** Berberine is a prospective TCM medicine in treating leukopenia resulted from radiotherapy and chemotherapy for nasopharyngeal carcinoma (Chen et al, 2003).

**Inhibitory Effects of Extracts of Yi Yi Ren used alongside Cisplatin or Mitomycin**

*Semen Coicis Lachryma-jobi (Yi Yi Ren)*

The experiments results showed that combination of total extracts of Yi Yi Ren and cisplatin or mitomycin could significantly improve the inhibitory rate of transplanted S-180 and hepatic cancer H22 in mice. It also had significant protective effect on the atrophy of immune organs, lowered phagocytic function of macrophages and leukopenia; meanwhile, it could improve the activity of NK cell (Li, 2000).

**Amenorrhea induced by chemotherapy (CMF or CAF/CTF/CEF, or TA/TAC) for breast cancer**

*Curculigo and Epimedium Decoction (Er Xian Tang)*

- Rhizoma Curculiginis orchioidis (Xian Mao)
- Herba Epimedi sagittati (Yin Yang Huo)
- Radix Morindaes Officinalis (Ba Ji Tian)
- Radix Angelicae sinensis (Dang Gui)
- Cortex Phellodendri chinense (Huang Bo)
- Rhizoma Anemarrhenae asphodeloidis (Zhi Mu)
Objective: Explore the influence of Kidney-tonifying method and Spleen-fortifying qi –invigorating method on amenorrhea induced by chemotherapy for breast cancer. Methods: 151 cases of postoperative breast cancer with amenorrhea due to chemotherapy were divided into two groups and treated with Kidney-tonifying method (Er Xian Tang group) and Spleen-fortifying qi –invigorating method (Si Jun Zi Tang) for 6 months respectively. It’s found that TCM could help improve menopausal symptoms due to chemotherapy in breast cancer. Compared with Spleen-fortifying qi –invigorating method of Si Jun Zi Tang, Er Xian Tang, which could tonify the Kidney, clearly improved the possibility of restoring normal menstrual cycles (Liu, Liu & Lin, 2007).

Hair loss induced by chemotherapy (cyclophosphane)
Huang Qi, Nu Zhen, Ren Shen

- Radix Astragali membranacei (Huang Qi)
- Fructus Ligustri lucidi (Nu Zhen Zi)
- Radix Ginseng (Ren Shen)

Hair loss model was established in C57BL/6 mice with cyclophosphane. TCM group was administrated with decoction of Huang Qi, Nu Zhen and Ren Shen, while the control group was administrated with physiological saline of the same volume. The conditions of hair loss and hair regeneration were observed. It’s found that the decoction of Huang Qi, Nu Zhen and Ren Shen could significantly reduce the apoptosis and retrogression of hair follicle cells in mice, accelerate hair regeneration and have certain preventive and therapeutic effect on hair loss induced by chemotherapy (Zhao & Fan, 2004).

Bone marrow suppression due to 5-Fu
Ginseng and danggui Ten Decoction (Shi Quan Da Bu Tang)

- Radix Rehmanniae glutinosae (Shu Di)
- Radix Astragali membranacei (Huang Qi)
- Cortex Cinnamomi cassiae (Rou Gui)
- Radix Ginseng (Ren Shen)
- Radix Angelicae sinensis (Dang Gui)
- Sclerotium Poriae cocos (Fu Ling)
- Rhizome Atractylodis macrocephalae (Bai Zhu)

H22 tumour-bearing mice were used to observe the mechanism of Shi Quan Da Bu Tang on bone marrow suppression induced by chemotherapy agent 5-Fu. The results showed that combination of Shi Quan Da Bu Tang and 5-
Fu could increase the WBC count; marrow nucleated cell count, expression of NF-κB in haematopoietic cells of marrow and inhibit the expression of Caspase-3. The results indicated that Shi Quan Da Bu Tang could antagonise the bone marrow suppression induced by chemotherapy agent 5-Fu on mice with hepatic cancer H22, and the regulation on apoptosis was involved in its mechanism (Luo et al, 2003).

**CHEMOTHERAPY AND RADIOTHERAPY SIDE EFFECTS:**
**FORMULAS, RESEARCH AND REFERENCES**

See TCM Glossary p.182

When using larger doses of common chemotherapeutical compounds such as 5-Fu or more frequent administrations, mucositis and even bloody diarrhoea may occur.

**Diarrhoea**

**Spleen Qi Deficiency**

- Radix Salviae miltiorrhizae (Dan Shen)
- Sclerotium Poriae cocos (Fu Ling)
- Rhizoma Atractylodis macrocephalae (Bai Zhu)
- Semen Dolichoris lablab (Bai Bian Dou)
- Pericarpium Citri reticulatae (Chao Chen Pi)
- Radix Dioscoreae oppositae (Shan Yao)
- Fructus Amomi villosi (Sha Ren)
- Radix Albus Paeoniae lactiflorae (Bai Shao)
- Semen Coicis lachryma-jobi (chao) Yi Yi Ren
- Rhizoma et Radix Notopterygii (Qiang Huo)
- Radix Ligustici wallichii (Chuan Xiong)

**Damp Heat**

- Radix Puerariae lobatae (Ge Gen)
- Radix Scutellariae baicalensis (Huang Qin)
- Rhizoma Coptidis recens (Huang Lian)
- Sclerotium Poriae cocos (Fu Ling)
- Radix Albus Paeoniae lactiflorae (Bai Shao)
- Radix Angelicae sinensis (Dang Gui)
- Radix Pulsatillae chinensis (Bai Tou Weng)
- Cortex Moutan radicis (Mu Dan Pi)
- Pericarpium Citri reticulatae (Chen Pi)
Constipation

Vinblastine and colchicines often cause constipation and/or intestinal obstruction.

Qi and Blood Deficiency

- Radix Scrophulariae ningpoensis (Xuan Shen)
- Radix Rehmanniae glutinosae (Sheng Di)
- Radix Ophiopogis japonici (Mai Dong)
- Semen Trichosanthis Kírlówii (Gua Lou Ren)
- Semen Pruni armeniáceae (Xing Ren)
- Semen Pruni persicáceae (Tao Ren)
- Cortex Magnóliae officínalis (Hou Po)
- Fructus Immáaturus Citri aurántii (Zhi Shi)
- Radix et Rhizoma Rhei (Da Huang)

Abdominal Pain

Internal Obstruction of Damp Heat

- Radix et Rhizoma Rhei (Da Huang)
- Cortex Magnóliae officínalis (Hou Po)
- Fructus Immáaturus Citri aurántii (Zhi Shi)
- Fructus Gardeniae Jasminóidís (Zhi Zí)
- Radix Scútellaríae baicalénsis (Huang Qin)
- Massa Medíca fermentata (Shen Qu)
- Rhizoma Alismati Orientalis (Ze Xie)

Qi Stagnation and Blood Stasis

- Radix Paeóniáe lactiflorae (Chi Shao)
- Pollen Typháe (Pu Huang)
- Resina Commíphorae myrracae (Mo Yao)
- Radix Angelicae sinensis (Dang Gui)
- Radix Ligústici wallichíi (Chuan Xiong)
- Fructus Foenículi vulgaris (Xiao Hui Xiang)
- Fructus Citri aurántii (Zhi Ke)
- Radix Bupleuri chinensis (Chái Hu)
- Rhizoma Cyperi rotundí (Xiang Fu)
- Pericarpium Citri retículatae (Chen Pi)
- Radix Paeóniáe lactiflorae (Bai Shao)
Chapter 6

Fatigue

- Fructus Lycii chinense (Gou Qi Zi)
- Fructus Ligustri lucidi (Nu Zhen Zi)
- Radix Polygoi muflori (He Shou Wu)
- Fructus Corni officinalis (Shan Zhu Yu)
- Semen Cuscutae chinensis (Tu Si Zi)
- Fructus Psoraleae corylifoliae (Bu Gu Zhi)

Cough

Cough due to Lung Dryness

- Radix Scutellariae baicalensis (Huang Qin)
- Cortex Fraxini (Qin Pi)
- Semen Descurainiae seu lepidii (Ting Li Zi)
- Radix Rehmanniae glutinosae (Sheng Di)
- Fructus Gardeniae Jasminoidis (Zhi Zi)
- Radix Platycodi grandiflori (Jie Geng)
- Cortex Mori albae (Sang Bai Pi)
- Flos Chrysanthemi morifolii (Ju Hua)
- Radix Trichosanthis kirilowii (Tian Hua Fen)
- Radix Glehniae littoralis (Bei Sha Shen)

Cough due to yin Deficiency

- Radix Rehmanniae glutinosae (Sheng Di)
- Radix Ophiopogonis japonici (Mai Dong)
- Bulbus Fritillariae cirrhosae (Chuan Bei Mu)
- Radix Scrophulariae ningpoensis (Xuan Shen)
- Cortex Moutan radicis (Mu Dan Pi)
- Radix Paeoniae lactiflorae (chao) Bai Shao
- Radix Asparagi cochinchinensis (Tian Dong)

Cough due to Phlegm Heat

- Rhizoma Phragmites communis, (Lu Gen)
- Semen Coicis lachryma-jobi (Yi Yi Ren)
- Semen Benincassiae hispidae (Dong Gua Ren)
- Semen Prunii persicae (Tao Ren)
- Fructus Trichosanthis kirilowii (Gua Lou)
- Radix Scutellariae baicalensis (Huang Qin)
Dry Mouth and Mouth Ulcers

Mouth Wash and Drink

- Radix Pseudoginseng (San Qi)
- Rhizoma Bletillae striatae (Bai Ji)
- Radix Astragali membranacei (Huang Qi)
- Cortex Phellodendri chinense (Huang Bo)
- Radix Trichosanthis kirilowii (Tian Hua Fen)
- Fructus Forsythiae suspensae (Lian Qiao)
- Radix Glycyrrhizae uralensis (Gan Cao)

Dissolve 3 grams of granules in 100 ml of hot water. When warm take small mouth full and hold in mouth for as long as possible. Swallow. Repeat until finished. Take dissolved mixture two or three times daily.

Oesophagitis

Toxic Heat injuring the Yin

- Radix Rehmanniae glutinosae (Sheng Di)
- Radix Scrophulariae ningpoensis (Xuan Shen)
- Radix Ophiopogonis japonici (Mai Dong)
- Radix Trichosanthis kirilowii (Tian Hua Fen)
- Herba Dendrobii (Shi Hu)
- Flos Lonicerae japonicae (Jin Yin Hua)
- Flos Chrysanthemi indici (Ye Ju Hua)

Gastritis

Disharmony of Liver and Stomach

- Radix Bupleuri chinensis (Chai Hu)
- Radix Angelicae sinensis (Dang Gui)
- Radix Albus Paeoniae lactiflora (Bai Shao)
- Sclerotium Poriae cocos (Fu Ling)
- Rhizoma Corydalis (Yan Hu Suo)
Chapter 6

- Radix Curcuma aromatica (Yu Jin)
- Fructus Melia toosendan (Chuan Lian Zi)
- Caulis Bambusae in taeniis (Zhu Ru)

**Stomach Heat injuring yin**

- Radix Ophiopogonis japonici (Mai Dong)
- Radix Adenophorae (Nan Sha Shen)
- Radix Trichosanthis kirlowii (Tian Hua Fen)
- Rhizoma Polygonati odorati (Yu Zhu)
- Radix Pseudostellariae (Tai Zi Shen)
- Herba Lophatheri gracilis (Dan Zhu Ye)

**With vomiting and nausea add:**

- Pericarpium Citri reticulatae (Ju Pi (Chen Pi))
- Caulis Bambusae in taeniis (Zhu Ru)
- Folium Eriobotryae praeparatae (Zhi Pa Ye)

**Proctitis**

**Damp Heat pouring downwards**

- Radix Pulsatillae chinensis (Bai Tou Weng)
- Cortex Phellodendri (Huang Bo)
- Cortex Fraxini (Qin Pi)
- Herba Portulacae (Ma Chi Xian)
- Radix Sanguisorbae officinalis ((chao) di yu)
- Flos Sophorae japonicae (Huai Hua)
- Semen Coicis lachryma-jobi (Yi Yi Ren)
- Radix Aucklandiae lappae (Mu Xiang)

**Spleen and Kidney Deficiency with Cold Damp accumulation**

- Radix Astragali membranacei (Huang Qi)
- Radix Codonopsis pilosulae (Dang Shen)
- Herba Epimediui sagittati (Yin Yang Huo)
- Rhizoma Atractylodis macrocephalae (Bai Zhu)
- Sclerotium Poriae cocos (Fu Ling)
- Radix Paeoniae lactiflorae (Chi Shao)
- Radix Paeoniae lactiflorae (Bai Shao)
- Fructus Evodiae rutaecarpae (Wu Zhu Yu)
• Semen Myristicae fragrantis (Rou Dou Kou)
• Semen Coicis lachryma-jobi (Yi Yi Ren)
• Rhizoma Cimicifugae (Sheng Ma)

**Xerostomia**

**Heat Dryness**

• Radix Scrophulariae ningpoensis (Xuan Shen)
• Cornu Antelopisis (Ling Yang Jiao)
• Radix Ophiopogonis japonici (Mai Dong)
• Gypsum Fibrosum (Shi Gao)
• Rhizoma Anemarrhenae asphodeloidis (Zhi Mu)
• Radix Rehmanniae glutinosae (Sheng Di)
• Cornu Bubali (Shui Niu Jiao)
• Radix Glycyrrhizae uralensis (Gan Cao)
• Herba Lophatherum gracile (Dan Zhu Ye)
• Radix Salvia miltiorrhiza (Dan Shen)
• Rhizoma Coptidis recens (Huang Lian)

**General Mouth Dryness with Mucus**

• Semen Scaphii lynchnophorii (Pang Da Hai)
• Radix Ophiopogonis japonic (Mai Dong)
• Flos Lonicerae Japonicae (Jin Yin Hua)
• Radix Platycodi grandiflori (Jie Geng)
• Radix Glycyrrhizae uralensis (Gan Cao)

**Toxic / Adverse Reactions to Chemotherapy**

**Heat and Stagnation**

• Radix Bupleuri chinensis (Chai Hu)
• Radix Astragali membranacei (Huang Qi)
• Rhizoma Pinelliae ternatae (Ban Xia)
• Flos Lonicerae Japonicae (Jin Yin Hua)
• Cortex Moutan radicis (Mu Dan Pi)
• Rhizoma Imperatae cylindricae (Bai Mao Gen)
• Folium Perillae frutescens (Zi Su Ye)
Add if constipated:

- Semen Raphani sativi (Lai Fu Zi)
  In China IM injections of Bupleurum extract often accompany this formula.

Yin Deficiency Heat with Fire

- Herba Artemisae annuae (Qing Hao)
- Carapax Amydae Sinensis (Bie Jia)
- Radix Rehmanniae glutinosae (Sheng Di)
- Cortex Moutan radicis (Mu Dan Pi)
- Cortex Lycii radicis (Di Gu Pi)
- Radix Paeoniae lactiflorae (Bai Shao)

Liver and Spleen Disharmony

- Radix Bupleuri (Chai Hu)
- Radix Angelicae sinensis (Dang Gui)
- Radix Paeoniae lactiflorae (Bai Shao)
- Sclerotium Poriae cocos (Fu Ling)
- Rhizome Atractylodis macrocephalae (Bai Zhu)
- Radix Astragali membranacei (Huang Qi)
- Radix Aucklandiae lappae (Mu Xiang)
- Rhizoma Cyperi rotundii (Xiang Fu)
- Flos Lonicerae Japonicae (Jin Yin Hua)
- Cortex Lycii radicis (Di Gu Pi)
- Cortex Moutan radicis (Mu Dan Pi)

Post Operative Recovery

Supplement Qi and Blood, Fortify the Spleen and Boost Kidney

- Radix Astragali membranacei (Huang Qi)
- Radix Pseudostellariae heterophyllae (Tai Zi Shen)
- Radix Angelicae sinensis (Dang Gui)
- Rhizoma Polygonati (Huang Jing)
- Caulis Millettiae reticulatae (Ji Xue Teng)
- Radix Paeoniae lactiflorae (Chi Shao)
- Radix Rehmanniae glutinosae (Sheng Di)
- Rhizome Atractylodis macrocephalae (Bai Zhu)
- Sclerotium Poriae cocos (Fu Ling)
- Pericarpium Citi reticulatae (Chen Pi)
Chinese Herbal Medicine and Chemotherapy/Radiotherapy

- Fructus Crataegi (Fried) (Jiao Shan Zha)
- Massa Medica Fermentata (Fried) (Jiao Shen Qu)
- Fructus Hordei vulgaris (Fried) (Jiao Mai Ya)
- Fructus Lycii chinensis (Gou Qi Zi)
- Radix Salviae miltiorrhizae (Dan Shen)
- Fructus Ligustri lucidi (Nu Zhen Zi)
- Herba Epimedii (Yin Yang Huo)

(All above; Cohen, Tagliaferrin & Tripathy 2007; Shi & Shi 1992; Pan 1992; Zhang, Hao and Zhang 2006; Shi & Shi 1989; Zhou & Wang 1985; Han & Shen 1991)

SINGLE HERB RESEARCH AND REFERENCES

Herbs for Diarrhoea

Fructus Amomum villosum (Sha Ren)
0.25~0.75% water decoction of yang chun sha had exciting effect on isolated intestinal canal. Its 1~1.25% water decoction and saturated water solution of volatile oil showed inhibitory effect. Sha Ren could promote the function of stomach, and the secretions of gastric juice (Zhu 1998 P.308).

Rhizome Atractylodes macrocephala (Bai Zhu)
Jie Chang Ling (experiential formula): chai hu, bai zhu, bai shao, chen pi, fang feng, zhi shi, huang bo, ku shen, 9g each; mu xiang, wu mei, 6g each; gan cao, 3g. Modify the formula according to TCM differentiation. 1 dose every day, water decoction. Enema mixture was also applied. 4 weeks as a course of treatment. 88 cases were treated, 84 cases were effective. Among 80 cases taking the re-examination of enteroscope, congestion, oedema and erosion disappeared in 68 cases, improved in 12 cases.

Pericarpium Citrus reticulata (Chen Pi)
The herb decoction inhibited the motility of the isolated small intestines of mice and rabbits; the intravenous injection of the decoction demonstrated an inhibitory effect on the gastrointestinal musculature of anaesthetised dogs, small intestine of anaesthetised rabbits, and stomach of anaesthetised rabbits. The action was weaker than that of epinephrine but more prolonged. This was probably due to the relative stability of the active component of the herb. In experiments on the isolated rabbit intestine, various kinds of Chinese medicines including this herb, which are reputed to “regulate the vital energy”, antagonised the effect of acetylcholine. But the inhibitory action of the herb on the isolated rabbit intestine was antagonised by acetylcholine. Further, the
herb could elicit relaxation of the intestines if the intestinal muscular tone was already reduced by pre-treatment with atropine.

The herb also antagonised intestinal spastic contraction due to pilocarpine or barium chlorite. All these results suggest that the mode of action mainly involves direct inhibition of the intestinal smooth muscles. Hesperitin had a biphasic action on the isolated intestinal muscles, i.e., an initial transient stimulant action followed by inhibition. In conclusion, the various actions of the herb on the digestive tract are not only due to its various constituents, but also subject to the functional states of the digestive tract itself. Hence, it exhibits aromatic, stomachic, carminative and anti-flatulent actions, and relieves stagnation of vital energy in the “spleen” and stomach.

**Rhizoma Coptidis recens (Huang Lian)**
The therapeutic effect of huang llian on bacillary dysentery was quite certain. Usually it could be cured within 5~7 days. The oral dosage: small dosage was 2~3g, large dosage was 8~12g, averaging 6g daily. Berberine showed excitatory effect on smooth muscles of the uterus, bladder, bronchia and gastrointestinal tract.

**Radix Dioscoreae Oppositae (Shan Yao)**
Shan Zhu Tang: shan yao 9g; shan zhu yu, huang qin, ying su ke, 3g each; long yan rou, ge gen, che qian zi, 4g each. Water decoction. 892 cases of infantile diarrhoea were treated, and all were effective except 16 cases.

**Semen Dolichos lablab (Bai Bian Dou)**
jiao shan zha 120g, bai bian dou hua 30g, water decoction, 1 dose every day. This method had good effects in treating acute bacillary dysentery.

**Rhizoma et Radix Notopterygii (Qiang Huo)**
chao cang zhu 90g; zhi da huang, zhi cao wu, chao xing ren and chuan qiang huo 30g were ground into fine powder, 1,5g bid. The method was used to treat 96 cases of bacillary dysentery. Results: 62 cases were cured, 28 improved and 6 ineffective.

**Radix Albi Paeoniae lactiflorae (Bai Shao)**
Shen Ji Gu Zhi Tang (chao bai shao, bai ji, chao bian dou, chao huai shan yao, bu gu zhi, 15g each; chi shi zhi 30g; ren shen, pao jiang, he zi, 10g each; gan cao 3g) was used to treat 55 cases of chronic colitis. With yang deficiency of the Spleen and Kidney, add fu pian and gan jiang; with Damp-Heat, add bai jiang cao, huang lian and ge gen; with prolonged diarrhoea, add ying su ke, sheng ma; with abdominal pain, add mu xiang; caused by emotional factors, add chai hu and fang feng. 1 dose every day, water decoction, 25 days as a course of
treatment with 4~7 days’ interval. After 1~3 courses, 37 cases were cured, 16 markedly effective, 6 improved and 2 ineffective.

**Sclerotium Poriae Cocos (Fu Ling)**
Huai shan yao, fu ling, 10g each; ji nei jin 5g, ying su ke 3g (dosage for one year old children).

**Radix Puerariae (Ge Gen)**
Shan Zhu Tang: shan yao, 9g; shan zhu yu, huang qin, ying su ke, 3g each; long yan rou, ge gen, che qian zi, 4g each. Water decoction. 892 cases of infantile diarrhoea were treated, and all were effective except 16 cases. Sheng ma 9g, ge gen 12g, chi shao 9g, gan cao 5g. 50 cases of acute bacillary dysentery were treated with modified formula, after 1~7 days’ treatment, 46 were cured, 3 improved and 1 ineffective. The total effective rate was 95%.

Shan Zhu Tang: shan yao, 9g; shan zhu yu, huang qin, ying su ke, 3g each; long yan rou, ge gen, che qian zi, 4g each; chao zhu ru10g; su geng, huo geng, mu xiang, bai zhu, fu ling, bian dou, ou jie, 10g each; chen pi, ge gen, 5g each; bai dou kou 3g. Modify the formula according to accompanied symptoms. Water decoction. The formula was used to treat 256 cases of infantile diarrhoea, and 251 cases were effective.

**Radix Pulsatillae Chinensis (Bai Tou Weng)**
Water decoction of 15~30g root of bai tou weng each day was used to treat amoebic dysentery in adults. For patients with severe condition, make 100ml juice from 30~50g bai tou weng for retention enema, once every day. 23 cases were observed, after an average 7 days’ treatment, all cases were cured. The formula consisting of bai tou weng18g; huang bo 9~18g; qin pi 6~9g; mu xiang, chen pi, gan cao, 3g each was used to treat 123 cases of acute bacillary dysentery, or acute attack of chronic bacillary dysentery. 1 dose every day, 7~15 days as a course of treatment. Results: the curative rate was 78%.

**Radix Salviae Miltiorrhizae (Dan Shen)**
Dan shen could increase the blood flow volume in gastric mucosa, inhibit tissue peroxidation, strengthening the anti-oxidant ability of gastric mucosa. Dan shen could stimulate the mucus secretions of gastric wall, consolidate the barrier of gastric mucosal, effectively block the ischemic and anoxia condition of gastric mucosa induced by ethanol so that prevent deep tissues of gastric mucosa from injury.

**Radix Scutellariae Baicalensis (Huang Qin)**
huang qin and he zi were made into powder, 2g, qid. Expectant treatment: fluid infusion for loss of body fluids, anti-febrile for high fever. 100 cases were treated. After average 2.5 days, symptoms disappeared; after 3.3 days, micros-
copy had normal results; after 5.3 days, the patients were clinically cured.

**Herbs for Constipation**

**Semen Pruni Armeniacae (Xing Ren)**
Benaldehyde hydrolysed from amygdalin could inhibit the activity of pepsin and affect the digestive functions. The fatty oil of xing ren could moisten the intestines and relax bowels.

**Radix et Rhizoma Rhei (Da Huang)**
Until recently the purgative activity of Rhizoma Rhei was attributed to oxyanthraquinones. However, recent research has identified sennosides A-F as being responsible constituents, and experiments on mice have added confirmation. Sennoside A is metabolised by intestinal bacteria, where it is transformed into rhein anthrone, and produces a purgative action.

**Semen Trichosanthis (Gua Lou Ren)**
Gua Lou Ren could promote bowel movements.

**Herbs for Abdominal Pain**

**Rhizoma Alismatis Orientalis (Ze Xie)**
Ze xie could antagonize acetylcholine-induced convulsion of isolated intestine muscles. Ze xie could inhibit the growth of tubercle bacillus.

**Radix Bupleuri (Chai Hu)**
Oral administration of crude saikosides had analgesic effect. Intraperitoneal injection of Saikogenin A at the dosage of 50mg/kg or 100mg/kg to mice could inhibit the writhe reaction in mice caused by intraperitoneal injection of acetic acid. Saikosaponins at the concentration of $1 \times 10^{-4} \sim 2 \times 10^{-4}$ could excite isolated intestinal smooth muscle, and wouldn’t be antagonized by atropine. Saikosaponins could obviously inhibit the secretions of gastric juice, lower the activity of pepsin, and tended to reduce ulcer index.

**Fructus Immaturus Citri Aurantii (Zhi Shi)**
Zhi shi decoction could excite the gastrointestinal smooth muscle, increase the contractive rhythm of gastro-intestinal movements. Zhi shi decoction had inhibitory effect on isolated intestinal canals of mice and rabbits. It also showed an inhibitory effect on in vivo intestines of anaesthetised dogs.

**Pericarpium Citri Reticulatae (Chen Pi)**
The herb decoction inhibited the motility of the isolated small intestines of
mice and rabbits; the intravenous injection of the decoction demonstrated an
inhibitory effect on the gastrointestinal musculature of anaesthetised dogs,
small intestine of anaesthetised rabbits, and stomach of anaesthetised rabbits.
The action was weaker than that of epinephrine but more prolonged. This was
probably due to the relative stability of the active component of the herb. In
experiments on the isolated rabbit intestine, various kinds of Chinese medi-
cines including this herb, which are reputed to “regulate the vital energy”, an-
tagonized the effect of acetylcholine. But the inhibitory action of the herb on
the isolated rabbit intestine was antagonised by acetylcholine.
Further relaxation of the intestines could be elicited by the herb if the intestinal
muscular tone was already reduced by pre-treatment with atropine.
The herb also antagonised intestinal spastic contraction due to pilocarpine or
barium chlorite. All these results suggest that the mode of action mainly in-
volves direct inhibition of the intestinal smooth muscles.
Hesperitin had a biphasic action on the isolated intestinal muscles, i.e., an ini-
tial transient stimulant action followed by inhibition.
In conclusion, the various actions of the herb on the digestive tract are not only
due to its various constituents, but also subject to the functional states of the
digestive tract itself. Hence, it exhibits aromatic, stomachic, carminative and
anti-flatulent actions, and relieves stagnation of vital energy in the “spleen”
and stomach.

**Rhizoma Cyperi Rotundi (Xiang Fu)**

Ethanol extract of xiang fu could relax isolated rabbit ileum, and antagonize
the contracture effect of acetylcholine, 5-HT and BaCl2. It had protective ef-
fect on the bronchial spasm caused by histamine spraying in guinea pigs.

**Fructus Foeniculi Vulgaris (Xiao Hui Xiang)**

Hui xiang oil could alleviate abdominal bloating and pain, lower the tension of
the stomach and then stimulate it to restore normal peristalsis. Anethole may
have anti-bacterial effect.

**Fructus Gardeniae Jasminoidis (Zhi Zi)**

Duodenol administration of genipin at the dosage of 75mg/kg to rats with
pylorus ligation could reduce the secretions of gastric juice and lower the total
acidity. Intravenous injection of geniposide and genipin could inhibit sponta-
neous stomach peristalsis and stomach contraction induced by pilocarpine in
rats. Alcohol extract of zhi zi at low dosages could excite the small intestinal
movement of rats and rabbits, at high dosages, it showed inhibitory effect.

**Radix Ligustici Wallichii (Chuan Xiong)**

Antispasmodic action was provided by ferulic acid and the neutral constituents.
Cortex Magnoliae Officinalis (Hou Po)
Hou po decoction could excite isolated intestinal canal of mice and guinea pigs at small dosage, and inhibit the canal at large dosage.

Massa Medica Fermentata (Shen Qu)
Fried shen qu and charred shen qu could promote gastric juice secretions.

Resina Commiphorae Myrrhae (Mo Yao)
Mo Yao had inhibitory effect on helicobacter pylori.

Radix Paeoniae Lactiflorae (Bai Shao)
Paeoniflorin had inhibitory effect on isolated intestinal canal and in vivo gastric movement in Guinea pigs and rats, as well as uterine in rats. Total glucosides of paeonia could dosage-dependently inhibit the writh and hot-plate reaction, and lengthen the latent period of hot-plate in rats, the peak time was 0.5~1 hour.

Radix Paeoniae Rubrae (Chi Shao)
Chi Shao Injection and α-catechin could relieve the spasm of isolated ileum induced by acetylcholine in Guinea pigs. Paeoniflorin could significantly inhibit the movements of intestinal canals of guinea pigs and rats as well as in vivo stomach.

Radix et Rhizoma Rhei (Da Huang)
It was shown in experiments with isolated rat intestines that emodin had a strong antispasmodic action (four times stronger than papaverine) against acetylcholine induced spasm.

Radix Scutellariae Baicalensis (Huang Qin)
Huang Qin tincture and decoction had significant inhibitory effect on in vivo intestinal canal.

Herbs For Fatigue

Fructus Corni Officinalis (Shan Zhu Yu)
Experiments with mice showed that shan zhu yu could obviously promote the number increasing of antigen combining cells, obviously inhibit the delayed allergic reaction induced by sheep red cells in mice. shan zhu yu can also lower the spleen index and thymus gland index, and have quite strong inhibitory effect on the auto oxidation of vegetable oil as well.

Jin Gui Shen Qi Wan, a prepared TCM product containing shan zhu yu, can improve the non-specific immunity and humeral immunity, and promote the
pre-generation of antibodies.

**Semen Cuscutae Chinensis (Tu Si Zì)**
Tu Si Zì had the functions of improving B lymphocyte’s function, promoting the generation of antibody, lengthening the survival time. Tu si zi also had androgenic hormone-like effect.

**Fructus Ligustri Lucidi (Nu Zhen Zi)**
Nu zhen zi had no obvious influence over the number of rosette forming cells. Gastrogavage of water decoction of wine-steamed nu zhen zi could increase the humoral immunity of mice. Decoction of nu zhen zi, decoction of steamed nu zhen zi and Er Zhi Wan (made from nu zhen zi and mo han lian) could all increase the non-specific immune function and antagonize the immunosuppression function of sterane. Intraperitoneal injection of nu zhen zi polysaccharide to mice could obviously enhance the immune function. 75% ethanol extract of nu zhen zi could promote the response of lymphocyte to PHA, and promote T lymphocyte.

The experimental results show that Erzhi Pills can markedly increase the weights of immunological organs in mice and antagonize the immunosuppressive action of prednisolone. The diameter of SRID precipitating ring, the haemolytic ability of PFC and the clearance rate of i.v. charcoal particles in mice can all be increased by the pills. Erzhi Pills also protect mice from CCl4 intoxication. Steamed Ligustrum lucidum has the same action as Erzhi Pills.

Aqueous extracts of Astragalus membranaceus and Ligustrum lucidum augmented the spontaneous [3H]thymidine incorporation in the mononuclear cells (MNC) of 14 normal subjects from 273.0 to 609.3 counts per minute (cpm) and 252.9 to 656.9 cpm respectively. The stimulation indices were 2.4 and 3.1, respectively (p less than 0.001). They also augmented the proliferation of normal subjects’ lymphocytes induced by suboptimal concentrations of phytohemagglutinin (PHA) from 5084.6 to 23,398.3 and 221.7 to 24,132.8 cpm, of concanavalin A (con A) from 4046.5 to 15,661.5 and 677.6 to 14,644.6 cpm, and of pokeweed mitogen (PWM) from 4377.9 to 24,405.6 and 322.7 to 11,730.0 cpm, respectively (p less than 0.00). Herb extracts augmented the PHA responses of the MNC from 14 cancer patients significantly (p less than 0.01 and p less than 0.05, respectively). Extracts of L. lucidum also augmented the con A response of patients (p less than 0.05). The augmenting effect of the herbs on the PHA, con A, and PWM responses was dose dependent, and proliferation was inhibited at higher concentrations. The optimal concentration for stimulating the MNC of cancer patients was 100 micrograms/ml, compared to 10 micrograms/ml for the MNC of normal donors. MNC of seven patients depressed the mitogen responses of normal cells in a co-culture system. This was partially abrogated in five by pre-incubating the patients’ cells.
in herb extracts for 45 min or by irradiation of the patients’ cells. These results suggest that the herb extracts contain immunomodulatory components, which may be useful in the immunotherapy of disease.

**Fructus Lycium Chinensis (Gou Qi Zi)**
Gou qi can increase the function of non-specific immunity; it can obviously increase the phagocytic ability of reticuloendothelial system in mice, the phagocytosis percentage and index of phagocytes, serum lysozyme activity and valence of antibody.

**Radix Polygonum Multiflorum (He Shou Wu)**
He shou wu could significantly increase the weight of thymus gland, celiac lymph nodes and adrenal glands. It could increase total count of normal cells, antagonize the immunosuppressive effect and WBC lowering effect of delta cortef. It could improve the phagocytic ability of celiac macrophages.

**Herbs for Cough**

**Tuber Asparagi Cochinchinensis (Tian Men Dong)**
Asparamide contained in tian men dong has anti-tussive and anti-asthmatic effects; β-sitosterol contained in ti has anti-tussive and expectorant effects.
tian dong 12g; bai bu, zhu li, honey, 9g each.
tian dong and bai bu were decocted first, the juice was mixed with zhu li and honey. 11 patients were treated and all were effective.
tian dong, mai dong, gan cao, 9g each; huang qin , gua lou ren, bai bu, ting li zi, ban xia, 6g each; ma huang, dan nan xing, di long, 3g each
All drugs were decocted with water. 50 cases were treated, after 7 days’ treatment, 28 cases were cured, 16 markedly effective, 6 ineffective.
tian dong, bai bu, ban xia, 9g each; bai ji, 6g; zhu ru, 7.5g; garlic 3~5 segment, decocted with water. 48 cases had a follow-up survey. Among them, 19 were markedly effective, 21 improved, 9 ineffective.

**Flos Chrysanthemi Morifolii (Ju Hua)**
Intramuscular injection of a preparation of the distillate of the fresh C.morifolium plant from Hangzhou, which chiefly contains the volatile oil (with a substance called chamzulene) 4 or 8mg/2ml, had definite therapeutic and prophylactic value: the aggregate effective rate achieved in patients with upper respiratory tract infection, tonsillitis, acute bronchitis and acute viral hepatitis was around 80%.

**Semen Coicis Lachryma-jobi (Yi Yi Ren)**
Fatty oil of yi yi ren could excite the respiration at small dosages, but could
anaesthetise the respiration at large dosages.

**Bulbus Fritillariae Cirrhosae (Chuan Bei Mu)**
Alcohol extract of bei mu had significant expectorant effect, and it also had anti-tussive effect. Fluid extract of chuan bei mu, alkaloids and saponins of chuan bei mu had expectorant effect to different degrees.
For children under 2 years old, bai bu and bei mu, 10g each; 3~5 years, 15g each; >5 years, 20g each. Water decoction 200ml~500ml, being taken in three days, three times every day.
50 cases of whooping cough were treated and all were effective.
chuan bei was made into tablets, 5 tablets, 4 times every day. The dose every day was equal to 6g crude drug. 10 days as a course of treatment. The method was used to treat chronic bronchitis, and the total effective rate was 86.46%.

**Radix Glehniae Littoralis (Bei Sha Shen)**
Bei sha shen and shan yao, 15g each were decocted to treat 24 cases of infantile persistent pneumonia whose courses varied from 1 to 3 months. Results: In 12 cases, main symptoms and signs disappeared and had no recurrence; in 9 cases, symptoms and signs disappeared; and 3 cases were ineffective.

**Semen Descurainiae seu Lepidii (Ting Li Zi)**
Ting li zi 3~5g, lai fu zi 4~6g, su zi 4~6g, niu bang zi 5~8g, zhi ke 5~8g, xing ren 3~5g, chuan bei mu 4~6g. Modify the formula according to accompanied symptoms. Routine treatment of western medicine was accompanied. 38 cases of infantile severe pneumonia were treated, 36 were cured and 2 dead.

**Cortex Mori Albae (Sang Bai Pi)**
Morus Alba in combination in combination proved useful in the early stages of common cold with symptoms of cough, mild fever, headache and nasal congestion and also useful in the early stage of measles.
The concentrate of Morus Alba in combination was used with good results in 40 children suffering from upper respiratory tract infections with symptoms of acute fever and cough; 22 of these cases were given the decoction with no other medication.
Morus Alba in combination was used to treat 72 cases of whooping cough. Improvement of different extents was achieved in 69 cases after one dose; the cough was completely relieved in 24 cases after 3 doses.

**Rhizoma Phragmitis Communis (Lu Gen)**
Animal experiments proved that asparagines had quite strong anti-tussive effect. lu gen, bai mao gen, si gua gen, 60g each, water decoction, taken in three times. The method could be used to treat acute bronchitis. lu gen, jin yin hua,
30g each; dong gui zi 12g; xing ren 9g, yi yi ren 15g, jie geng 9g, water decoction. The method had quite good effect on pulmonary abscess.

**Radix Platycodi Grandiflori (Jie Geng)**
Administration of the Platycodon grandiflorum decoction 1g/kg PO to anaesthetised dogs markedly increased mucous secretion in the respiratory tract; its potency resembled that of ammonium chloride. Likewise, a marked expectorant effect was demonstrated in anaesthetised cats.

It was reported that Platycodon grandiflorum was a more potent expectorant than the root of Polygala tenuifolia but weaker than that of Polygala senega L. However, the result of the phenol red test in mice showed that platycodin was weaker than the root of Polygala tenuifolia. The oral doses of Platycodon grandiflorum irritated the pharyngeal and gastric mucosae, reflexedly increasing mucous secretion in the respiratory tract and diluting the sputum for easy expectoration. The crude preparation of Platycodon grandiflorum had an anti-tussive effect, its ED50 in guinea pigs was determined to be 6.4 mg/kg IP. Two cases of lung abscess were reported to have been effectively treated with Radix Platycodon White Powder (composed of P. grandiflorum, Fructus Crotonis, and Bulbus Fritillaria Cirrhosa). Radix Platycodon Decoction (composed of P. grandiflorum and Radix Glycyrrhizae) was also useful in lung abscess and lobar pneumonia. P. grandiflorum is often combined with other anti-tussives and expectorants in compound formulae and widely used in the treatment of common cold, cough, upper respiratory tract infection, bronchitis, and pneumonia.

**Semen Pruni Armeniacae (Xing Ren)**
Amygdalin was the effective ingredient of xing ren’s anti-tussive effect. It also had sedative effect. Hydrocyanic acid decomposed from amygdalin could inhibit the respiration centre and had anti-tussive and anti-asthmatic effect.

xing ren 5g, sang bai pi 6g, di gu pi 8g, huang qin 4g, bai mao gen 10g, lai fu zi 10g, gua lou ren 3g, qian hu 6g, dan nan xing 3g, sheng gan cao 3g. 1 dose daily, 3 doses as a course of treatment. 42 out of 43 treated cases of infantile cough were effective.

**Xing Ren Tang (experiential formula):** xing ren 6g, jie geng 5g, gua lou 6g, bei mu 6g, qian hu 6g, huang qin 6g, jin yin hua 10g. Modify the formula according to TCM differentiation. 150 cases of infantile pneumonia were treated, after 5~15 doses, 89 were cured, 46 markedly effective, 15 in effective.

**Semen Pruni Persicae (Tao Ren)**
Tao Ren had anti-tussive and anti-inflammatory effects.

Experiential formula: tao ren 15g, xing ren 10g, yi yi ren 30g, yu xing cao 30g, jie geng 12g, dan pi 12g, bai mao gen 30g, jin yin hua 15g, lian qiao 15g, huang
Radix Scutellariae Baicalensis (Huang Qin)
Animal experiments showed that huang qin could relieve asthma. β-sitosterol contained in it had anti-tussive effect. 50% huang qin decoction, 6ml for children under 1 year old, 8~10ml for those over 1 year old. Increase the dosage properly for children over 5 years old. Take the medicine in three times. 51 cases acute respiratory tract infection, 11 cases of acute bronchitis and 1 case of tonsillitis. After treatment, the body temperature lowered to normal and symptoms disappeared in 31 cases, 12 were ineffective.

Radix Stemonae Sessilifoliae (Bai Bu)
Alkaloids contained in bai bu could lower the excitability of respiratory centre in animal, inhibit cough reflex and show antitussive effect. It could relax histamine-induced spasmodic bronchia in isolated Guinea pig, the strength was similar to that of aminophyllin, but slow and persistent. Powder of bai bu 500g was made into pills with chicken juice, 10g every time, twice daily. 20~30 days as a course of treatment. 153 cases of pulmonary tuberculosis were treated, after 1~2 courses, 72 cases took a re-examination of X-ray, and 56 cases were improved.

Fructus Trichosanthis Kirilowii (Gua Lou)
Lou Sang Tang (experimental formula): quan gua lou, sang bia pi, chen xiang, zhi qian niu zi, concentrated decoction of 100ml being taken in two or more times after supper and before sleep. 7 days as a course of treatment. 30 cases of infantile cough and asthma were treated and all were cured.

Herbs For Post Operative Recovery

Radix Angelicae Sinensis (Dang Gui)
A.sinensis and ferulic acid potentiated the phagocytic activity of macrophages
when given to mice.

**Radix Astragali Membranacei (Huang Qi)**
The A. membranaceus decoction given to mice orally at a dose of 0.5 ml daily or on alternate days for 1-2 weeks increased the phagocytic activity of the reticuloendothelial system. The phagocytic index was significantly increased even if the rehabilitation of the mouse reticuloendothelial system was disrupted by the injection of carbon particles prior to the administration of A. membranaceus. Concomitant use of rifampicine and G. lucidum Mixture (Radix Astragali, Radix Codonopsis Pilosulae, Ganoderma Lucidum) improved and regulated the suppressed immunologic function of mice. When used with antituberculous drugs, the mixture significantly decreased the mortality rate and prolonged the median survival time of tuberculous mice. These results are significantly better than that achieved with antituberculous drugs alone. G. lucidum Mixture also greatly enhanced the bactericidal function of the spleen. It was shown in antiviral studies that either the oral doses or nose drops of the A. membranaceus decoction protected mice from infection of parainfluenza virus type I. Results from 28 experiments using 1299 mice in total showed that the effect of A. membranaceus resembled, by and large, those of the interferon mediator, tilorone, and bronchitis vaccine. Oral administration or nasal spray of this herb offered protection against the common cold in an epidemiological study involving 1000 subjects. Though the herb was not itself an interferon inducer, it could promote the production of interferon by the mouse lung against parainfluenza virus type I and Newcastle disease virus. In patients susceptible to common cold, administration of this herb for two weeks or two months enhanced the induction of interferon by peripheral white blood cells as compared with the premedication stage. Similar results were demonstrated in studies with mice. The induction of leukocytes to produce interferon in patients could be one of the antiviral mechanisms of A. membranaceus. Addition of A. membranaceus to the culture of mouse renal cells increased their production of interferon in that the interferon titer was much higher in the A. membranaceus group than in the control group. Two months of oral treatment with this herb in subjects susceptible to common cold greatly increased the levels of SIgA and IgG in the nasal secretion. Moreover, quantitative changes in the SIgA were found correlated with the severity of the common cold. Tablets of the dried fluidextract of the whole plant given to 80 normal subjects by mouth greatly increased the IgM and IgE. These results indicate that A. membranaceus promotes humoral immunity.

In comparison with the control, addition of the herb decoction to rat renal cell culture, whether before or after a challenge by follicular stomatitis virus, lowered the viral titer in the treated cells, indicating that A. membranaceus could inhibit the pathogenicity of virus on cell cultures. Further studies revealed that
the inhibitory effect of A. membranaceus on viral multiplication is mediated by cells. In addition, A. membranaceus enhanced the specific rosette formation of mouse lymphocytes on sheep red blood cells. Atrophy of the immune tissues such as the spleen, thymus, and intestinal lymph nodes, as well as Leukopenia, all caused by the immunosuppressant, prednisolone, were antagonised by the polysaccharides of the herb. Concomitant injection of the polysaccharides with the allergen via the same route produced a pronounced adjuvant effect wherein the number of plaque-forming cells was increased.

**Rhizome Atractylodis Macrocephalae (Bai Zhu)**
Intragastric administration of the decoction of A. macrocephala for one month increased the body weight and swimming endurance of mice. It was reported that the herb could increase the phagocytic function of the reticuloendothelial system. It was able to increase leukocytes in patients with leukopenia. The herb also increased the lymphocyte transformation rate, promoting cellular immunity and markedly increasing serum IgG.

**Fructus Crataegi Pinnatifidae, (Fried) (Jiao Shan Zha)**
Enzymes in the gastric juice will be increased after taking shan zha. Lipase contained in shan zha can promote the digestion of fat and other food.

**Herba Epimedii Sagittati (Yin Yang Huo)**
E. sagittatum has been shown to regulate the immunological functions. It enhanced the functions of antibody forming cells as well as the excitatory state of the lymphatic cells; it also increased the phagocytic activity of the monocytes and the number of T-cells. The polysaccharide isolated from E. sagittatum was found to accelerate the production of T-suppressor cells of immunized mice and to inhibit the antibody production in recipient mice; icariin, on the other hand attenuated the production of T-suppressor cells and the antibody titer was therefore markedly elevated. At Bethune Medical University it was found that Epemedii Flavone (EF) exhibits extraordinary augmenting effect on the response of T-cells to mitogen in immunodepressed mice (IDM). The immuno-potentiating effect of EF on T-cells appeared three days after its administration and continued to the end of the experiment (6th day). The stimulatory index of lymphocyte transformation in IDM was maintained higher than the index without EF. It was also evident that the immuno-potentiating effect of Epemedii Flavone is closely related to the level of cyclic nucleotides, especially the ratio cGMP/cAMP.

**Fructus Hordei Vulgaris (Fried) (jiao Mai Ya)**
mai ya could promote digestion as it contains amylase and vitamin B.
Fruit Ligustri Lucidi (Nu Zhen Zi)
Nu zhen zi had no obvious influence over the number of rosette forming cells. Gastrogavage of water decoction of wine-steamed nu zhen zi could increase the humoural immunity of mice. Decoction of nu zhen zi, decoction of steamed nu zhen zi and Er Zhi Wan (made from nu zhen zi and mo han lian) could all increase the non-specific immune function and antagonize the immunosuppression function of sterane. Intraperitoneal injection of nu zhen zi polysaccharide to mice could obviously enhance the immune function. 75% ethanol extract of nu zhen zi could promote the response of lymphocyte to PHA, and promote T lymphocyte.

The experimental results show that Erzhi Pills can markedly increase the weights of immunological organs in mice and antagonize the immunosuppressive action of prednisolone. The diameter of SRID precipitating ring, the haemolytic ability of PFC and the clearance rate of i.v. charcoal particles in mice can all be increased by the pills. Erzhi Pills also protect mice from CCl4 intoxication. Steamed Ligustrum lucidum has the same action as Erzhi Pills.

Aqueous extracts of Astragalus membranaceus and Ligustrum lucidum augmented the spontaneous \(^{[3]H}\)thymidine incorporation in the mononuclear cells (MNC) of 14 normal subjects from 273.0 to 609.3 counts per minute (cpm) and 252.9 to 656.9 cpm respectively. The stimulation indices were 2.4 and 3.1, respectively (p less than 0.001). They also augmented the proliferation of normal subjects’ lymphocytes induced by suboptimal concentrations of phytohaemagglutinin (PHA) from 5084.6 to 23,398.3 and 221.7 to 24,132.8 cpm, of concanavalin A (con A) from 4046.5 to 15,661.5 and 677.6 to 14,644.6 cpm, and of pokeweed mitogen (PWM) from 4377.9 to 24,405.6 and 322.7 to 11,730.0 cpm, respectively (p less than 0.00). Herb extracts augmented the PHA responses of the MNC from 14 cancer patients significantly (p less than 0.01 and p less than 0.05, respectively). Extracts of L. lucidum also augmented the con A response of patients (p less than 0.05). The augmenting effect of the herbs on the PHA, con A, and PWM responses was dose dependent, and proliferation was inhibited at higher concentrations. The optimal concentration for stimulating the MNC of cancer patients was 100 micrograms/ml, compared to 10 micrograms/ml for the MNC of normal donors. MNC of seven patients depressed the mitogen responses of normal cells in a co-culture system. This was partially abrogated in five by pre-incubating the patients’ cells in herb extracts for 45 min or by irradiation of the patients’ cells. These results suggest that the herb extracts contain immunomodulatory components, which may be useful in the immunotherapy of disease.
Fructus Lycii Chinensis (Gou Qi Zi)
Gou Qi Zi can increase the function of non-specific immunity; it can obviously increase the phagocytic ability of reticuloendothelial system in mice, the phagocytosis percentage and index of phagocytes, serum lysozyme activity and valence of antibody.

Massa Medica Fermentata (Fried) (Jiao Shen Qu)
Fried shen qu and charred shen qu could promote gastric juice secretions.

Rhizoma Polygonati (Huang Jing)
Huang Jing could improve lymphocyte transformation rate; increase immune function; promote the synthesis of DNA, RNA and protein; lower the plasma content of cAMP and cGMP; increase the survival rate of animals exposed to radiation; accelerate the proliferation of hematopoietic stem cells and restore the haematopoiesis.

Sclerotium Poriae Cocos (Fu Ling)
Another compound from P. cocos is poriatin, which has immuno-stimulating activities, antiviral activities and the ability to activate peritoneal macrophages and increase pinocytosis and phagocytosis. It can also improve the production of colony stimulating activity by macrophages, lymphocytes and other cells, shortening the period of leukocytopenia and enhance lysosomal enzyme activity “with protein and RNA synthesis”. Poriatin is especially interesting in that it has also demonstrated immunosuppressive activity and is an aldosterone antagonist.

Radix Pseudostellariae Heterophyllae (Tai Zi Shen)
Water decoction of tai zi shen could obviously stimulate the proliferation of lymphocytes.

Radix Rehmanniae Glutinosae (Sheng Di)
The 100% injection of Sheng Di given by intraperitoneal injection 1 ml daily for 6 days, could mitigate platelet damage caused by irradiation with 600 rad and hasten the normalisation of platelet count

Radix Salviae Miltiorrhizae (Dan Shen)
Dan Shen could increase the blood flow volume in gastric mucosa, inhibit tissue peroxidation, strengthening the anti-oxidant ability of gastric mucosa. dan shen could stimulate the mucus secretions of gastric wall, consolidate the barrier of gastric mucosal, effectively block the ischemic and anoxia condition of gastric mucosa induced by ethanol so that prevent deep tissues of gastric mucosa from injury.
Dan Shen had inhibitory effect on cervical carcinoma in mice.
Note: Except those noted, all references are from: Weiliang 1998; Wang 1983 and/or Shen 1983
<table>
<thead>
<tr>
<th>Herbal Agent</th>
<th><strong>Immune Modulatory Effects Reported</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Radix Astragali (Huang Qi)</td>
<td>Increased CD4/CD8 ratio and phagocytic activity in patients with gastric cancer undergoing chemotherapy. Stimulation of lymphocytes IL-2, IL-3, IL-6, TNF-α and IFN-γ.</td>
</tr>
<tr>
<td>Radix Salviae Miltiorrhizae (Dan Shen)</td>
<td>Increased T lymphocyte production and function.</td>
</tr>
<tr>
<td>Rhizoma Atractylodis Macrocephalae (Bai Zhu)</td>
<td>Increased phagocytosis, lymphocyte transformation, rosette formation, and serum IgG post chemotherapy.</td>
</tr>
<tr>
<td>Sclerotium Poriae Cocos (Fu Ling)</td>
<td>Increased monocyte GM-CSF production. Enhanced recovery of myelosuppression in mice after radiation. Increased spontaneous rosette formation, lymphocyte transformation, and serum IgG.</td>
</tr>
<tr>
<td>Fructus Lycii Chinensis (Gou Qi Zi)</td>
<td>Enhanced haematopoiesis, ameliorates lowering of number and function of T lymphocytes, CTL and NK cells in mice after cyclophosphamide.</td>
</tr>
<tr>
<td>Tuber Asparagi Cochinchinensis (Tian Men Dong)</td>
<td>Enhanced humoural and cellular immunity with Wu Zhu Yu (Fructus Evodiae Rutaecarpa). Increased production of IL-1β, IL-6, TNF-α, and GM-CSF in mononuclear cells in vitro.</td>
</tr>
<tr>
<td>Radix Rehmanniae Glutinosae Conquitae (Shu Di Huang)</td>
<td>Increased TNF production, reversal of suppression of cytokine production in mice after cyclophosphamide. Increased IL-2 and IFN-γ by murine splenic lymphocytes both in vitro and in vivo and IL-2 and IFN-γ production in mice after cyclophosphamide. Reduced immunosuppression effect in mice caused by cyclophosphamide and steroids.</td>
</tr>
</tbody>
</table>
### Table 20
*Herbal Agents – immune modulatory effects reported*

<table>
<thead>
<tr>
<th>Herbal Agent</th>
<th>Immune Modulatory Effects Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructus Ligustri Lucidi</td>
<td>Lessened leukopenia due to chemotherapy or radiation</td>
</tr>
<tr>
<td><em>(Nu Zhen Zi)</em></td>
<td></td>
</tr>
<tr>
<td>Herba Solidaginis</td>
<td>Improved regenerative capacity of bone marrow after chemotherapy</td>
</tr>
<tr>
<td><em>(Liu Zhi Huang)</em></td>
<td></td>
</tr>
</tbody>
</table>

*(Liu, Yao & Shen, 1996)*
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CHAPTER 7

GUIDELINES FOR T-CAM USE
IN THE CANCER CLINIC
While herbs and supplements are commonly used by cancer patients (Cassileth et al., 2001) there appears to be little integration at this time of such use in a cohesive manner (Shia, Shaw, & Dargan, 2004). There are a number of clinical trials from China that suggested that Chinese herbal medicines used together with conventional therapies improve the mortality and morbidity of cancer patients (Liang et al., 2003; Liu, C. L., et al., 2001). These findings were often substantiated by experimental studies (Liu, Z., et al. 2002; Qu et al., 2003). Nisula (2006) writes on medical integration of Ayurvedic Medicine and biomedicine in South India; for the majority of informants biomedical treatment was an obvious first choice of treatment, a form of therapy that was taken for granted, if compared with the preference for Ayurvedic services, which were usually utilised because of the failure of biomedicine.

The World Health Organisation is facilitating integration of T-CAM into national health care systems by helping Member States to develop their own national policies on T-CAM as well as producing guidelines for T-CAM (WHO, 2002). With the exception of the People’s Republic of China, the Democratic People’s Republic of Korea, the Republic of Korea and Viet Nam, such integration has nowhere taken place (WHO, 2002). This underlines the fact that in some countries national assessment is needed to ascertain which T-CAM modalities can be best integrated with the national health care system.

In China and India formal training is an integral part of the national health program, which helps in ensuring quality standards in health care delivery (Patwardhan et al., 2005). China has become successful in integrating TCM into the national health care system (Chen, C. F., Shum, & Yang, 2004). A scientific research based approach is being utilised and inculcated in the education of TCM (Chen, H. et al., 2007). Hospitals practicing TCM treat more than 200 million outpatients and almost 3 million inpatients annually (Chen, H. et al., 2007). About 95% of general hospitals in China have traditional medicine departments (State Administration of Traditional Chinese medicine of the People’s Republic of China, 1997).

India needs a clear policy for integration of traditional values without compromise on the strategies that are science-based (Patwardhan et al., 2005). Efforts are needed to establish and validate pharmacoepidemiological evidence regarding safety and practice of Ayurvedic medicines (Vaidya, R.A., Vaidya, A. D. B., Patwardhan, Tillu, & Rao, 2003). Pharmaco-economic studies on traditional Indian medicine (TIM) and TCM are rare, but can help in understanding cost-effectiveness and cost benefit of traditional medicine (Patwardhan et al., 2005).
This last point brings another dimension to the issue of integrative oncology: cost. While exact costs of oncology treatments are difficult to ascertain, the overall cost of OM pharmaceutical costs are available (Johns Hopkins Medicine Health Alerts, 2007). The “global spend on pharmaceuticals has risen 25-fold numerically over as many years from 20 billion in 1972 to more than (US) $500 billion in 2004” (Law, 2006, p. 10). This may account for both the interest and resistance to T-CAM integrative cancer interventions. Furthermore the cost as adjusted to gross domestic product (GDP) has increased significantly (Organisation for Economic Co-operation and Development [OECD], 2008). In the United Kingdom spending on health care rose from 3.9% in 1960 to 5.6% of GDP in 1980 and 7.7% in 2002. In the United States in 1960, 5% of GDP was spent on health care, in 1980, 8.7% and 14.6% in 2002 (OECD, 2008). Spending on pharmaceutical drugs in the United States was US$180 billion in 2003, a rise of 11% in one year (National Centre for Health Statistics, 2004).

In the United States the integration of T-CAM in OM hospitals is recognised as a coming necessity and the users generally are younger, better educated, more affluent and more inclined to hold a philosophical orientation that supports holistic approaches to health (Lewis, Paterson, Beckerman, & Sandilands, 2001). The Clinical Journal of Oncology Nursing published an article in 2006 on CAM in the oncology clinic suggesting an integrated approach with patients (Chong, 2006). Cancer Treatment Centres of America (http://www.cancercentre.com/), the University of Texas MD Anderson Cancer Centre (http://www.mdanderson.org/), and Memorial Sloan-Kettering Cancer Centre (http://www.mskcc.org/mskcc/html/44.cfm) are all recognised hospitals with extensive T-CAM research facilities. The National Institutes of Health National Centre for Complementary and Alternative Medicine (http://nccam.nih.gov/) and the National Cancer Institute (http://www.cancer.gov/) all fund and promote high quality research in CAM by supplying grants (United States Department of Health & Human Services, 2009).
Summary

Integrative oncology is a reality, certainly within the patient’s own thoughts and actions. The debate and the actual implementation of this integration in practitioners’ own thinking is still contentious. While political and professional manoeuvring, debates on correct interventions and mutual distrust distort and prevent a simple co-operation between OM and T-CAM, the patient suffers. Up to 80% of cancer patients use some form of T-CAM and yet rarely communicate this fact to their oncologist and when they do they are often belittled and sometime bullied. This leaves them open to exploitation from unscrupulous and unethical persons as they have no place to get adequate and responsible information. Google ‘cancer cure’ and it gives 2,850,000 sites, Google ‘cancer cure diet’ and one gets 340,000,000 hits, most of which contain misinformation or worse, promises that expose the questioner to deadly activities. Most patients do not proceed past page 1. Unless medical oncology and T-CAM find a unified basis for co-operation, patients will suffer needlessly. While EBM is a noble and desirable goal for prescribing treatment it is not always possible to achieve. Using traditional medicines and/or current in vitro studies to enhance OM can be of value to a patient that cares nothing for ‘proof’ or ‘what is working’ but wants the best for her/him self. Set standards for research, set standards for training and create forums for communication to create that integration we so desperately need.
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CHAPTER 8

SUMMARY
“Your health is determined not only by your genes, after all, but also by your environment” (Tsou, cited in Mitchell, 2009, p. 34). Orr (2009, p. 34), in The New York Review of Books, says “science is the defining intellectual enterprise of our age” but the difficulty is in how science is defined. In medicine it ranges from the narrow and restrictive approach in evidence based medicine (EBM) to the more loosely constructed empirical science of traditional medicine. The major criticisms and limitations of evidence-based medicine appearing in the literature over the past decade can be summarised and categorised into five recurring themes. The themes include: reliance on empiricism, narrow definition of evidence, lack of evidence of efficacy, limited usefulness for individual patients, and threats to the autonomy of the doctor/patient relationship (Cohen, Stavri, & Hersh, 2004).

The scientific model vastly improved medical practice by defining the pathophysiology of disease. A progressively better understanding of human biology with an enhanced ability to improve survival has come at the cost of the patient-physician relationship (Snyderman & Weil, 2002, p. 395). Integrative medicine is a new movement being driven by the desire of the consumer, which calls for a restoration of the focus of medicine on health and healing where technology does not dominate the critical relationship. The integrative medicine movement is also fuelled by the growing discontentment of medical doctors with the direction of their profession and the inability of the current system to deliver the best healthcare available (Snyderman & Weil, 2002, p. 396).

In the Journal of Alternative and Complementary Medicine, Yeung writes that medical researchers need a broad range of skills to choose a path of inquiry that will most adequately provide understanding of TCM but also to the unique predisposition of each individual and he calls for qualitative research rather than quantitative research (Yeung, 2009, p. 5). In qualitative research the aim is a complete, detailed description while in quantitative the aim is to classify features, count them, and construct statistical models in an attempt to explain what is observed. In the qualitative, researchers may only know roughly in advance what s/he is looking for but in the quantitative researchers know clearly in advance what is looked for. Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail while qualitative data is richer, more time consuming, and less able to be generalised. The process of qualitative research is inductive in that the researcher builds abstractions, concepts, hypotheses, and theories from details (Merriam, 1988, p. 18). The issues invoke classic paradigm war over what is real science.

The need for integrative medicine is real and is driven by the consumer, the suf-

Summary
Complementary medicine has improved training standards and is now in the University system in Australia. TCM is registered in Victoria and there are plans to register all complementary practitioners in NSW by 2010. Increasingly, medical schools are moving away from admitting only the highest scores to interviewing applicants and looking at students with more ‘people skills’. These Universities are also including CAM training in their curriculum. Ernst (2009, p. 51) estimates that approximately 5,000 clinical trials of CAM have been published during the last decade.

CAM is a relevant topic for the care of cancer and according to Eustachi, Pajtler, Linde, Melchart, & Weidenhammer (2009), in a survey of an interdisciplinary cancer treatment centre the current use of CAM is 52%, while an additional 24% sought information on CAM (Eustachi et al., p. 56).

What is needed is a new paradigm for health. Integrative medicine extends across the whole spectrum of interventions, keeping health and restoring health. It thinks about the coordination of care across the spectrum of services. At its most basic, integrative medicine is the embodiment of patient-centred care (Fineberg, 2009). Ka-Kit Hui (as cited in Abbott & Zhang, W., 2007) has spoken of the need for establishing a theoretical and scientific construct of a new model of medicine based on findings from the latest scientific research on the integration of modern orthodox medicine and TCM, at the 2006 UCLA Centre for East-West Medicine annual conference.

Integrative medicine is not a radical movement but it can produce major changes in health care. It must refocus on the patient and away from the disease, it must understand the benefits and limits of both orthodox and CAM and it should “become the cornerstone of the urgently needed reconfiguration of our increasingly dysfunctional system of health care – it will be the medicine of the new century” (Snyderman & Weil, 2002, p. 397).

What is needed is research, which supports clinical decisions for the various polymorphisms found in patients suffering from cancer. Broad, flexible yet accurate protocols to guide complementary as well as orthodox practitioners.
References


GLOSSARIES

Glossary of Chinese Medicine Terms.................................................. 182
Glossary of Ayurvedic Terms.............................................................. 188
GLOSSARY OF CHINESE MEDICINE TERMS

Blood Cold
Symptoms: Coldness and pain in the hands, feet, and lower abdomen which can be relieved by heat. Aversion to cold, preference for warmth. Irregular menstrual cycle, dysmenorrhea—painful menstrual cycle, menses will be dark purple with clots. Tongue will be pale with white fur. Pulse is slow and deep.

Blood Deficiency
The main function of ‘blood’ is to nourish and moisten the body. When someone is blood deficient it simply means that the blood is not nourishing the body, as it should. Digestive disorders, not assimilating nutrients properly or loss of blood may cause it. When you are blood deficient you may experience dizziness, blurred vision, pale complexion, dry skin, and hair loss and there may be menstrual difficulties. The tongue will appear pale.
Symptoms: pale, dim or sallow complexion, pale lips, tongue and fingernails, dizziness, blurred vision, palpitation, insomnia, numbness of limbs, rough skin, delayed menstruation or amenorrhea; thready or feeble pulse.

Blood Heat

Blood Stagnation
Blood stagnation means that the blood is not flowing freely. An injury or a blockage of energy circulation, which is not allowing the blood to flow, can cause this. The primary symptom of blood stagnation is pain, which is often fixed, stabbing pain. Other symptoms, which may accompany blood stagnation, are dark complexion, delayed menses, and purplish nails. The tongue will appear purplish and may have purple spots.
Symptoms: Pain, the most prominent symptom, is fixed in location and is stabbing in nature. It is aggravated by palpation and worse at night. Dark complexion, purplish lips and nails. Delayed menses with dark blood and blood clots, or amenorrhea (no menses) Dark purple tongue, could have purple spots. Thready, uneven pulse.

Cold Syndrome of Excess
Symptoms: Aversion to cold, cold limbs, pale complexion, abdominal pain and tenderness, constipation or diarrhoea, profuse sputum, cough, inability to taste, copious clear urine. Whitish, moist or thick, greasy fur on tongue. Slow
or tense pulse.

**Dampness/Phlegm**
Dampness is a common condition and it is often seen in hot, humid climates or in modern times from too much worry. Damp weather and/or weak digestive function can cause it. Most people who have dampness will complain of a heavy feeling in their bodies or ‘fuzzy’ feeling in their heads. Other symptoms can be loss of appetite, loose stools, sticky taste, or vaginal discharge. The tongue will have a greasy coating. Phlegm is similar to dampness however it may manifest in other parts of the body including Lungs, Stomach, and channels. It may appear as a variety of symptoms such as a cough with phlegm or can cause swellings or lumps under the skin.

**Damp Heat**
Damp heat is a common condition in Chinese medicine and it is often seen in hot, humid climates. It can be caused by damp weather, by poor dietary choices or as the result of a low-grade viral infection. Excessive intake of alcohol, spicy or greasy foods may aggravate dampness leading to damp heat. Some symptoms of damp heat will be a heavy feeling in the body, burning feeling with defecation, dark yellow urine, vaginal discharge, or or a desire for iced cold drinks. The tongue will have a greasy yellow coat.

**Damp Heat in Spleen**
Symptoms: nausea, heavy sensation in limbs, sticky bitter taste in mouth, yellow complexion, feeling hot, loose stool, burning sensation with stool, scanty brownish urine. Red tongue with yellow, greasy fur. Rapid, soft pulse.

**Disturbance of the Spirit**
One of the strong points of Chinese medicine is its recognition of the psycho-spiritual aspects of the individual and how these manifest physically. The Spirit can be easily affected in our everyday hectic lives and as a result it manifests as anxiety, stress, insomnia, or palpitations. By treating the spirit it allow people to better deal with their demanding lifestyles. The tongue may have a red tip.

**Food Stagnation**
Symptoms: acid regurgitation, borborygmus with bad odour, fullness or pain in the upper abdomen. Putrid or foul smelling stools. Thick, greasy fur. Slippery pulse.

**Heart Blood Deficiency**
Symptoms: Palpitation, insomnia, dull or pale complexion, pale lips and
tongue. Feeble, thready pulse.

**Heart Qi Deficiencies**
Symptoms: Palpitation, shortness of breath and oppression in the chest, aggravated by movements. Pale complexion, listlessness and fatigue, spontaneous perspiration. Pale tongue with white fur. Feeble, knotted or intermittent pulse.

**Heart Yang Deficiency**
Symptoms: Aversion to cold, cold limbs, bright pale complexion, oedema of hands and feet, purplish lips. Pale and swollen tongue, white, moist, smooth fur. Thready, feeble pulse.

**Heart Yin Deficiency**
Symptoms: Palpitation, irritability, insomnia, hot hands and feet, night sweats. Dry mouth and throat, tongue sores. Dry and deep red tongue. Thready, rapid pulse.

**Heat Syndrome of Excess**
Symptoms: high fever, thirst, flushed face, delirium, abdominal distension, pain and tenderness, dry stool, dark urine. Yellow thick or greasy coat of tongue. Full, rapid pulse or slippery, rapid pulse.

**Jing Deficiency**
Jing Deficiency (and problems with the Kidneys storing Jing) frequently has many of the symptoms of Kidney Yang and Kidney Yin Deficiency PLUS problems having to do with development and maturity. Bones don’t develop properly, premature ageing, the menstrual cycle problems and problems with conception (though Jing disorder is not the only possible cause of this), the hair may be prematurely grey, there may be congenital retardation, the genitals may fail to develop properly, there may be hereditary enzyme problems, birth defects, and a host of other genetic disorders as well as impotence and low libido.

**Kidney Yang Deficiency**
Symptoms: lassitude in the loins and knees, cold hands and feet, intolerance of cold, feeling listless and inert, pale complexion, loose stool with undigested food, frequent urination or frequent urination at night. Impotence, seminal emission, infertility. Swollen tongue with white fur. Deep and thready pulse.
Kidney Yin Deficiency
Symptoms: lassitude in the loins and knees, dizziness, tinnitus, insomnia, heat in the hands and feet, dry mouth and throat, night sweats. Scanty menstruation, amenorrhea, metrorrhagia. Red tongue with little fur. Rapid pulse.

Liver Affecting Spleen
The Liver in Chinese medicine ensures smooth flow of energy in the body and directly affects the other organs; it is also the primary organ involved with menstruation. The Spleen is primarily involved with digestion and transformation. It is common with our western dietary habits to weaken the Spleen; as a result it is easy for the Liver energy to overwhelm the Spleen. Some symptoms involved with Liver affecting Spleen are alternating constipation and diarrhoea, tiredness, irritability, abdominal distension, and fullness in the chest. The tongue may be red on the sides or pale.

Liver Blood Deficiency
Symptoms: dizziness, tinnitus, dull or sallow complexion, dry eyes, night blindness, numbness of the limbs, pale nails, trembling hands and feet. Delayed menses, scanty menstruation, pale lips, and amenorrhea. Pale tongue with white fur. Taut and thready pulse.

Liver Qi Stagnation
The Liver in Chinese medicine is the organ that ensures smooth flow of energy and is the primary organ involved with menstruation. When the liver qi is stagnant, the energy is obstructed and this gives rise to emotional disturbances. In a contrary fashion, emotional repression itself may cause constraint. When someone has Liver Qi Stagnation they will most likely have emotional disturbance, PMT, and menstrual irregularities. Other common symptoms will be sighing frequently, irritability, anger, depression, painful menstruation, and any symptoms that get worse with emotional turmoil. The tongue may have red sides.
Symptoms: sensation of oppression in the chest, sighs frequently, depression or anger. Dysmenorrhea—painful periods, irregular periods. Symptoms which worsen according to stress or emotional turmoil. Wiry or taut pulse.

Liver Yang Uprising
Symptoms: flushed face, dizziness, tinnitus, distending pain in head and eyes, feeling heavy in the head, insomnia. Red tongue. Forceful, taut or thready pulse

Liver Yin Deficiency
Symptoms: dizziness, tinnitus, dry eyes, blurred vision, hot sensation in hands
and feet, night sweats. Red tongue. Rapid, thready pulse.

**Lung Heat**
Symptoms: cough, yellow and thick sputum, cough with blood, fever, thirst, dry stool, deep-coloured urine. Red tongue with yellow fur. Slippery, rapid pulse.

**Lung Qi Deficiency**
Symptoms: feeble cough that is worse with exertion, fatigue, pale complexion, feeble voice, spontaneous perspiration, aversion to wind, catch cold easily. Pale tongue with white fur. Weak pulse.

**Lung Yin Deficiency**
Symptoms: cough without or blood stained sputum, dry throat, flushed cheeks in the afternoon, fever in the afternoon, night sweats, hot hands and feet. Red tongue with little fur. Thready, rapid pulse.

**Phlegm Accumulation**
Phlegm accumulation is the result of long term Spleen qi xu and Liver constraint. The Lung and Kidney are also involved. Feelings of oppression in the chest, nausea, a feeling of heaviness and a ‘fuzzy’ head with dizziness. Swollen tongue body with a sticky coat. A slippery or wiry pulse.

**Qi and Blood Deficiency**
Symptoms: shortness of breath and unwillingness to speak, fatigue, vertigo, blurred vision, spontaneous perspiration, palpitation, insomnia, pale or sallow complexion, pale and tender tongue, thready and feeble pulse.

**Qi Deficiency**
Symptoms: shortness of breath, dizziness, blurred vision, spontaneous sweat, listlessness, lassitude, pale tongue and weak pulse. Symptoms are worse after exertion.

Qi is a term that refers to our body’s vital energy; it is what fuels us to get through our daily lives. Qi can easily become deficient for a variety of reasons after an illness or simply due to our lifestyle, whether it is simply too demanding or stressful. Some symptoms you may have with qi deficiency are fatigue, dizziness, shortness of breath, and tiredness after exertion or meals. The tongue may be pale or puffy.

**Qi Stagnation**
Symptoms: oppression and distending pain in the chest, hypochondrium and abdomen, frequent sighing, onset of pain or symptoms are related to emotions.
Symptoms may be relieved by borborygmus or flatus. Patient will feel better after exercise.

**Spleen Disharmony**
The Spleen is primarily concerned with digestion and through this function it has a direct relationship with our energy. This is a common complaint seen in clinic and is often the result of poor dietary habits. Any Spleen disharmony will always involve the digestive process with such symptoms as abdominal distension, loose stools and lack of appetite. Other symptoms involved in a Spleen disharmony will be weakness of limbs, tiredness, and abdominal pain. The tongue may appear swollen and wet.

**Spleen Qi Deficiency**

**Spleen Yang Deficiency**
Symptoms: poor appetite, abdominal distension, dull abdominal pain, loose stool, and intolerance of coldness, cold extremities, and profuse leucorrhoea. Plump, pale tongue with white fur. Deep, feeble pulse.

**Stomach Yin Deficiency**
Symptoms: dull stomach-ache, gastric discomfort with acid regurgitation, hungry but not able to eat, dry mouth and throat, dry stool, fullness in the upper abdomen, hiccups. Red tongue with little fur. Thready, rapid pulse.

**Yang Deficiency**
The yang energy of the body is associated with warming, movement, and energy. When the yang is deficient, the heat of the body has been damaged and it will result in too much cold internally. Some signs of yang deficiency will be loose stools, cold hands and feet, and a pale complexion. The person will feel cold in general and will prefer to be covered up and want warm drinks. The tongue will be pale and slightly wet.

Symptoms: Chills, cold limbs, listlessness, lassitude, spontaneous sweat, absence of thirst, clear urine increased in volume, loose stools. Pale tongue w/ white coating. Weak pulse.

**Yin Deficiency**
The yin energy of the body is associated with moistening, cooling and nourishing. When the yin is deficient, the body fluids have been damaged and it will result in heat signs. Some signs of yin deficiency will be thirst, night sweats, hot flashes, and a red flushed face. The person in general will feel warm and cool,
nourishing herbs are advised.

**Symptoms:** Afternoon fever, malar flush, heat sensation in the palms and soles, night sweating, dryness of throat and mouth, yellow urine, dry stools. Red tongue w/ little coating. Thready and rapid pulse.

### GLOSSARY OF AYURVEDIC TERMS

**Akasha**
Free space, void, substratum of the property of sound, also referred to as ether in other sciences.

**Ama**
Raw, undigested food products, having become fetid, producing toxins in the system. It is formed due to malfunctioning of Agni. Ama is considered as the main cause of most diseases.

**Anticoagulant**
Ayurvedic herb examples: Sesame seed oil (4 parts), black mustard seed (1 part), mix together and apply to the affected area, massage in well.

**Antiepileptic**
Ayurvedic herb examples: Red purnarnava: 500mg (a laxative works well on the central nervous syst–take daily, after meals).

**Asthi**
One of the seven dhatus, the bone tissue, supports the body by forming the skeleton, giving protection, shape, nourishment and longevity.

**Atman**
True self, the self, spiritual self, oneself. The cause of consciousness.

**Basti**
Enema therapy of panchakarma which is induced and controlled general indications for Basti: Constipation, low backache, gout, rheumatism, sciatica, arthritis, nervous disorders, vata, headache, emaciation, muscular atrophy etc.

**Brahma**
The first in the Hindu God Trinity, the creator of each element in the universe, taking the universe as his body, manifesting the energy of creation.

**Churna**
Churna means “Powder” in Sanskrit. Churnas are ayurvedic preparations and may contain isolated or a combination of herbs and minerals.
Dhanvantari
The incarnation of Vishnu (the second in the Hindu God Trinity), the physician of the Gods, said to have been produced at the churning of the ocean with a cup of nectar in his hand, represents the true healer in all beings.

Dhatu
The basic nutritional and structural factors of the body, literally, to support or to nourish, there are seven dhatu (tissues) in the body. The seven bodily tissues are rasa, rakta, mamsa, meda, asthi, majja and shukra.

Dipaniya
Kindles the gastric fire, increases the appetite. Substances one may use are: Pippali, ginger, black pepper, ajwain, and hing (asfoetida).

Diuretic
Promotes activity of kidney and bladder and increases urination. Ayurvedic herbs examples: Aamalaki, ashwagandha.

Dosha
Dosha literally means fault, blemish, defect, or morbid substance, the three Doshas are vata, pitta, and kapha, these three Dosha are responsible for maintaining the integrity of the human body, governing all the biological, psychological, and physiopathological functions of the body, mind, and consciousness. Every being is born with an inherent combination of Doshas and that decide the constitution or ‘Prakruti’. A change in the balance of the Doshas leads to diseases.

Dravya
Substance, the substratum of properties, one of the special properties of the nine eternal substances accepted in Ayurveda. The nine eternal substances are: Earth, Water, Fire, Air, Ether, Time, Space, Self, and Mind.

Dukkha (doo–k–kha)
Means “Unhappiness” in Sanskrit. Vata persons tend toward a Dukkha of insecurity, anxiety, fear, loneliness. Pitta constitution individuals tend towards a Dukkha involving judgment, nothing to do, being judged, criticism, and lack of acknowledgment. Kapha dukkha is related to too much physical activity and hardship.
Hrudya (hru–dya)
Promotes cheerfulness, heart strengthener, strengthens the cardiovascular system, improving elasticity and dilation. Substances to use for this are: Arjuna, pomegranate, punarnava, gold, rudraksha, gulwel, and triphala.

Karma
Action, work, a complex concept, the word originally denoted a religious act or rite and gradually assumed other shades of meaning, as in, action, work, past actions as producing good or evil results, the accumulated effect of deeds in lives, past and present.

Kapha
One of the three dosha, the water humor, the extracellular and intracellular fluid playing a vital role in the nutrition and existence of cells and tissues in the body. Responsible for strength, lubrication of joints etc.

Keshya (key–shya)
Strengthens the hair and the hair root. Substances one may use are: Licorice, jatamamsi, hibiscus, elephant tusk, amla (aamalaki), and brahmi (the latter two strengthen hair roots).

Khichadi (khi–cha–di)
Is a simple dish of basmati rice and split mung dal (one of the pulses), with the appropriate spices added according to one’s dosha, and/or according to the particular nutritional healing that needs to be addressed. It is easily digested and assimilated, and is the primary food to be taken during panchakarma. The basic recipe calls for one part mung dal and two parts basmati rice, with the appropriate herbs as mentioned above.

Lekhaneeeya
Scraping fat from the body, removes the non–essential adipose tissue (catabolic). Substances one may use are: Honey, hot water, vacha, kutki, copper k, and shilajit. Good for cellulite removal.

Majja
One of the seven dhatus, bone marrow, it is unctuous and soft, its main function is to oleate the body, to fill up the asthi, and to nourish the shukra.

Malas
Waste products: Primarily includes urine, feces, and sweat.

Mamsa
One of the seven dhatus, produced by rasa and rakta, its main function is to
provide physical strength, and to support meda dhatu.

**Marmas**
These Marmas are the 365 vital energy points in the body, of which 108 are of great importance in Ayurveda, anatomically, marmas are perceived as nerve crossings where nerves come to the fascia, they relate to the vital organs of the body. Injury to a marma leads to serious harm to the organ/body part related to that marma.

**Meda (may–da)**
One of the seven bodily tissues (dhatus), it is the fat tissue, supported by mamsa dhatu, its function is to support the body and to lubricate the body, meda in excessive quantity may produce obesity and physical weakness.

**Moksha**
Liberation, spiritual freedom, release, the spiritual self dwelling in its own nature. Hindu mythology states that a being, after death is re–born in some other form depending on his Karma. Moksha is the ultimate freedom after which the being is transported to the Heaven.

**Nasya**
Nasal administration of herbs. The nose is the doorway to the brain and it is also the doorway to consciousness. The nasal administration of medication is called Nasya. It is a part of panchakarma. An excess of bodily humors accumulated in the sinus, throat, nose or head areas is eliminated by means of the nearest possible opening, the nose.

**Ojas**
Vitality, luster, splendor, superfine essence of body tissues, prevents decay and degeneration of the body, while supporting the body, it provides strength and is essential for sustenance.

**Paachaneeya**
Aids digestion. Substances one may use are: Fennel, coriander, cumin, trikatu, and chitrak.

**Panchakarma**
The five–fold purification measures, for the purpose of internal purification, these are: Vomiting (vamana), purgation (virechana), decoction/oily enema (basti), and nasal administration of specific medications (nasya). Panchakarma is often thought of as the entire procedure. It is one part of a group of therapies belonging to a class of cleansing procedures called shodhan. There is also a group of milder techniques called shaman for those not strong enough for
shodhan.

**Pitta**
One of the three doshas, the bile humor, is responsible for body temperature and physiochemical activities (metabolism) constantly going on in the body during life.

**Prakruti**
The Unconscious, material–energy principle, the inherent relationship between self and matter is an eternal attribute of prakruti, primal nature, also, the individual’s constitution which is determined by the doshas and fixed at the time of arrival.

**Rakta**
Second of the seven dhatus, supported by rasa, it is one of the most important dhatus, responsible for the nourishment of the permanent dhatus, provides physical strength and color to the body, the basis of the life, it can be referred to as blood.

**Rakta–mokshan**
One of the methods in panchakarma. It means blood–letting. This is done either by venesection or with the help of leeches. The sites depend upon the ailments. It is very beneficial in gout, skin disorders, pigmentation of skin, blood disorders, alopecia etc.

**Rasa**
The first of the seven dhatus, Rasa is derived from the digested food, and after absorption it circulates in the entire body by specific channels, its main function is to provide nutrition to each and every cell of the body, can be compared to the plasma.

**Rasayana**
Rejuvenate therapy which regenerates body–mind, prevents decay, postpones ageing. Rejuvinating herbs are: Aamalaki, ashwagandha.

**Shukra**
The last of the seven dhatus, can be compared to the male reproductive tissue (Aartava refers to the female reproductive tissues. But sometimes the word Shukra means both Shukra and Aartava).

**Sukha**
Sukha is “Happiness” in Sanskrit. Vata persons when experiencing sukha are easily bored, vata sukha is superficial, physical, and shaky. Pitta sukha involves
solving problems, understanding, and solving puzzles. Kapha sukha is passive, involving napping, eating or sitting.

**Triphala**
An ayurvedic preparation consisting of aamalaki, haritaki, bibhitaka. It is commonly used as a laxative.

**Trikatu**
An ayurvedic preparation consisting of sunthi (dry ginger), pippali (Indian long pepper), and kali mircha (black pepper).

**Vamana**
Therapeutic vomiting, one of the five methods of panchakarma. Indications for Vamana: Used for all kapha type disorders – good for pitta headache, dizziness, and nausea will help to release blocked emotions, urticaria, respiratory, congestion, bronchitis, chronic, cold, sinus, congestion, asthma caused due to kapha dosha.

**Varnya**
Improves the complexion. Substances one may use are: Turmeric, sandalwood, manjista, and grass (darba).

**Vata**
One of the three humors (doshas), wind (air), that force which keeps kapha, pitta, and all of the seven dhatus and the malas in motion. Responsible for all voluntary and involuntary movements of the body.
INDEX
5-FU ........................................... 144

A

Abdominal cancer ............ 111
Abdominal pain .......... 146, 155–7, 182
Abrus precatorius .......... 87
Acetaminophen ............. 116
Acniddia arguta ............ 76
Adenocarcinomas ...... 25, 75, 79, 121
Adenophora tetraphylla .... 149
Adenosine triphosphate (ATP) dyspoiesis ......................... 40
Adjuvant chemotherapy . 5, 6–7, 83
Aegle marmelos ............ 85
Agaricus blazei ............ 114
Agati grandiflora .......... 85
Aglaja roxburghiana ....... 86
Agrimonia pilosa .......... 141
Ai Fu Kang Granules ...... 137–42
chemotherapy formula .... 141–2
functions and indication ... 139
ingredients .................. 138
pharmacodynamic research . 139–40
radiotherapy formula ...... 141
Akasha ........................................ 188
Albizzia lebbeck ............ 87
Alismatis orientalis ....... 146, 155
Alkylglycerols ............. 109–10
Allium sativum (garlic) ... 16, 87, 123
Aloe vera ................................. 87
Alpha-lipoic acid ........... 107, 111, 114, 116, 120, 123, 124, 125
Alpha-tocopherol .......... 94
Alpinia oxyphylla .......... 137
Alstonia scholaries ....... 87
Alternative medical systems .. 9
Ama ................................. 188
Amenorrhea ................. 143
Amomum villosum ........ 145, 152
Amura rohitaka ............ 87
Amyda sinensis ............ 151
Anacardium occidentale .... 87
Andrographalide ........... 108
Anemarrhena asphodeloides...... ............................ 143, 150
Aneuploidy ......................... 29–30
Angelica sinensis .......... 136, 138
141, 143, 144, 145, 146, 148, 151, 162
Angiogenesis .............. 27
Anthracycline treatment ........ 107
Anticancer drugs
see also Chemotherapy
Ayurvedic herbs enhancing ........ 83
natural products, based on ....... 16
Anticoagulant .............. 188
Antiepileptic ...................... 188
Antioxidants ................... 94–5, 116
Apoptosis 25–8, 74–5, 78, 80–2, 29, 91, 95
evasion of ....................... 26
Arbuda ...................... 47, 84, 86
Pittha arbuda ................. 86
Vataja arbuda ................. 86
Arca subcrenata ............ 82
Aristolochia species .......... 15
Arnebiae seu Lithospermi ...... 76
Artemisa annua ............ 151
Ascites cancer .............. 76, 80, 87, 88, 89
Ascorbic acid .............. 111, 117, 123
Asparagus cochinichinensis ......... 75, 141, 147, 159, 167
Asparagus racemosa ........ 87
Asthi .............................. 188
Astragalus .............................. 117
Astragalus membranaceus ...... ............................ 74, 136, 138
141, 142, 144, 148, 149, 150, 151, 163
Astragalus polysaccharides (APS). 74
Atman .............................. 188
Atractylodes macrocephala ......... 141, 144, 145, 149, 151, 152, 164, 167
Aucklandia lappa ............ 149, 151
Ayurvedic medicine (AM) ............
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>air</td>
<td>48–9</td>
</tr>
<tr>
<td>arbuda</td>
<td>47, 84, 86</td>
</tr>
<tr>
<td>arterial system</td>
<td>49</td>
</tr>
<tr>
<td>Basti</td>
<td>49, 50, 188</td>
</tr>
<tr>
<td>body-control systems</td>
<td>49</td>
</tr>
<tr>
<td>cancer clinic, use in</td>
<td>172–3</td>
</tr>
<tr>
<td>cancer definition</td>
<td>47</td>
</tr>
<tr>
<td>cancer treatments</td>
<td>83–90</td>
</tr>
<tr>
<td>classification of neoplasm</td>
<td>47</td>
</tr>
<tr>
<td>Doshas</td>
<td>49–50, 83–4, 86, 189</td>
</tr>
<tr>
<td>earth</td>
<td>48–9</td>
</tr>
<tr>
<td>ether</td>
<td>48</td>
</tr>
<tr>
<td>fire</td>
<td>48–9</td>
</tr>
<tr>
<td>five great elements</td>
<td>48–50</td>
</tr>
<tr>
<td>glossary of terms</td>
<td>188–93</td>
</tr>
<tr>
<td>granthi</td>
<td>47, 84, 85–6</td>
</tr>
<tr>
<td>groups of diseases</td>
<td>47</td>
</tr>
<tr>
<td>herbs</td>
<td>83–90</td>
</tr>
<tr>
<td>humours</td>
<td>49</td>
</tr>
<tr>
<td>integration into national health care systems</td>
<td>172, 174, 178</td>
</tr>
<tr>
<td>Kapaja granthi</td>
<td>85</td>
</tr>
<tr>
<td>Kapha</td>
<td>49, 50, 84, 190</td>
</tr>
<tr>
<td>Kaphaja arbuda</td>
<td>86</td>
</tr>
<tr>
<td>Kaphaja neoplasm</td>
<td>49</td>
</tr>
<tr>
<td>Nasya</td>
<td>49, 50, 191</td>
</tr>
<tr>
<td>nervous system</td>
<td>49, 188</td>
</tr>
<tr>
<td>Paittika granthi</td>
<td>85</td>
</tr>
<tr>
<td>Panchakarma</td>
<td>49, 191</td>
</tr>
<tr>
<td>Pitta</td>
<td>49, 50, 84, 192</td>
</tr>
<tr>
<td>Pittaja arbuda</td>
<td>86</td>
</tr>
<tr>
<td>Pittaja neoplasm</td>
<td>49</td>
</tr>
<tr>
<td>Rakta-mokshana</td>
<td>49, 50, 192</td>
</tr>
<tr>
<td>spiritual basis</td>
<td>46</td>
</tr>
<tr>
<td>surgical procedures</td>
<td>85</td>
</tr>
<tr>
<td>TCM compared</td>
<td>46, 47</td>
</tr>
<tr>
<td>Tridosaja neoplasm</td>
<td>49</td>
</tr>
<tr>
<td>Tridoshas</td>
<td>47</td>
</tr>
<tr>
<td>Vamana</td>
<td>49, 50, 193</td>
</tr>
<tr>
<td>Vata</td>
<td>49, 50, 84, 193</td>
</tr>
<tr>
<td>Vataja arbuda</td>
<td>86</td>
</tr>
<tr>
<td>Vataja neoplas</td>
<td>49</td>
</tr>
<tr>
<td>Vatika granthi</td>
<td>85</td>
</tr>
<tr>
<td>venous system</td>
<td>49</td>
</tr>
<tr>
<td>Virechana</td>
<td>49, 50</td>
</tr>
<tr>
<td>water</td>
<td>48–9</td>
</tr>
</tbody>
</table>

B

| Ba Ji Tian                                                           | 137, 142, 143 |
| Bacopa monniera                                                      | 87 |
| Bai Bian Dou                                                        | 145, 153 |
| Bai Bu                                                               | 148, 162 |
| Bai Hua She She Cao                                                 | 138, 141 |
| Bai Ji                                                               | 148 |
| Bai Mao Gen                                                         | 150 |
| Bai Shao                                                             | 141, 144, 145, 149, 151, 152, 164, 167 |
| Bambusa tuloides                                                    | 149 |
| Ban Bian Lian                                                        | 138 |
| Ban Xia                                                             | 150 |
| Ban Zhi Lian                                                         | 120, 138 |
| Basella rubra                                                        | 85 |
| Basti                                                                | 49, 50, 188 |
| BCNU                                                                 | 116 |
| Bee products                                                         | 11, 15 |
| Bei Sha Shen                                                         | 147, 160 |
| Benincasa cerifera                                                   | 86 |
| Benincasa hispida                                                    | 147 |
| Berbamine                                                            | 83 |
| Berberine                                                            | 143 |
| Berberis aristata                                                    | 87 |
| Beta-carotene                                                        | 94, 119 |
| Bie Jia                                                              | 151 |
| Biofield therapies                                                   | 9 |
| Biologic treatments                                                  | 11, 91 |
| Biological compounds                                                 | 91 |
| Biomedical treatment                                                 | 172 |
| Black cohosh                                                         | 15, 115 |
Bladder cancer ........................................ 31, 33, 81, 112
Bletilla striate ............................................. 148
Blood
   Ai Fu Kang ........................................ 138, 139
cell counts .............. 117, 119, 120, 136
   chemotherapeutic agents
damaging ......................... 136
cold .................................. 182
deficiency/vacuity......................... 39, 40, 44, 146, 182, 186
gong fa activating ....... 72–3, 78
   heart blood deficiency ......... 183
   heat ................................ 45, 182
   liver blood deficiency ...... 39, 185
   qi and blood deficiency ....... 39, 146, 186
   raktamokshana ......................... 50
   stagnation ...................... 44, 146, 182
   supplementing ..................... 151
Bombyx Batryticatus, larva .......... 82
Bone cancer .................. 79
Bone marrow
   regeneration .................. 168
   suppression .................. 144
Boswellia serrata ...................... 87
Botanicals ......................... 11, 12, 14
Bowen’s disease .................... 81
Brahma ........................................... 188
Brain tumor .................... 79, 87
Breast cancer
   amenorrhea ...................... 143
   antioxidants .................. 94
   Ayurvedic herbs .............. 89
   Curcumin ....................... 91
   EGCG ................................ 91
   Fago-c ................................ 79
   5-Fu - melatonin .............. 119
   five-year disease-free survival
   rates ................................ 34
   gamma-linolenic acid ....... 123
   grape seed extract .......... 106
   homeopathy ..................... 95
   incidence ......................... 35–6
   Melatonin ....................... 108–9
   mortality ......................... 35–6
   oleic acid ....................... 123
   san leng ......................... 78
   silibinin .......................... 107–8
   Vitamin C ....................... 117, 123
   Vitamin D3 ....................... 106
   Vitamin E ......................... 93
Bu fa ........................................ 72–3, 74–5
Bu Gu Zhi ......................... 137, 141, 147
Bubalus bubalis ......................... 150
Bulbus Fritillaria cirrhosa ...... 147, 160
Bupleuri radix saponins ............. 81
Bupleurum chinensis .................... 151
   ................. 81, 146, 148, 150, 151, 155
Burkitt’s lymphoma .................. 33
Caesalpinia sappa ........................................ 86
Calamus rotang ......................... 85
Calotropis gigantea ..................... 88
Camptothecin ......................... 116
Cancer
   CAM and ......................... 65–8
   common traits .................. 26–7
definition ......................... 25
genetic determinants .......... 26
   hallmarksof ....................... 26–7
   history of disease .............. 24–5
   history of word ................ 24
   incidence ......................... 35–6
   mortality rate .................. 35–6
   orthodox medicine view ..... 24–36
   statistics ......................... 29–36
   traditional Chinese view .... 38–46
   traditional Indian view ....... 46–52
treatments ......................... 72–96
Cancer-initiating cells (CICs) .... 30
Cao He Che ............................... 77
Index

Capcetibine .......................... 119–20
Capparis sepiaria ....................... 85
Capparis spinosa .......................... 85
Carapax Amyda sinensis ............. 151
Carboplatin ........................ 107, 114
Carcinogenesis ......................... 26
Carcinoma .............................. 24, 25
Carnosol ................................ 124
Cassia cinnamon ....................... 142, 144
Caulis Bambusa tuldoides .......... 149
Caulis Millettia dielsiana .......... 141
Caulis Spatholobus suberectus ........ 137, 151
Cell cycle/ growth signal autonomy ............................................... 26–7
Cephalotaxus hainanensis .......... 83
Cervical cancer
Ayurvedic herbs ......................... 89
Fago-c and ................................ 79
five-year disease-free survival rates .................................................. 31, 32
gua lou not effective ................ 80
shan dou gen ......................... 76
Chai Hu ................................... 81, 146, 148, 150, 151, 155
Chao Chen Pi .......................... 145
Chemotherapeutic agents ............. 113
heat toxin, as ............................. 136
herbs/supplements and ................. 14, 114–25
Chemotherapy .......................... 5, 7
adjuvant ............................... 5, 6–7, 83
Ai Fu Kang formula .................... 141–2
antioxidants and ......................... 94–5
Ayurvedic herbs reducing toxicity ............................................... 83
Chinese medicine, adjunctive treatment ........................................ 136–42
compounds used with .................. 94–5, 106–9, 113–25
five-year disease-free survival rates .................................................. 32–3
gong fa ................................... 73
hair loss ................................ 144
herb/supplement interactions ........ 14–5
multi-drug resistance (MDR) ....... 106–7
multi-drug therapy, multimodality ........................................ 6–7
carcinogenesis .......................... 26
side effects, treating .................... 142–52
single-drug therapy .................... 6
supplements used with ................. 94–5, 105–9, 113–25
toxic/adverse reactions ............... 150–1
Vitamin E ................................ 93
zhe bei mu as adjunctive .......... 79
Chen Pi .................................... 145, 146, 149, 151, 152, 155
Chi Shao .................................. 146, 148, 149, 151, 157
Chinese herbal medicine (CHM) see Traditional Chinese medicine (TCM)
Choline .................................... 92
Chromosome instability ............... 28
Chrysanthemum indicum .......... 148
Chrysanthemum morifolium ........ 147, 159
Chuan Bei Mu ......................... 147, 160
Chuan Lian Zi ......................... 149
Chuan Xiong .......................... 145, 146, 156
Churna .................................... 188
Cimicifuga heracleifolia ............. 150
Cimicifuga racemosa (black cohosh) .................................................. 15, 115
Cinnamomum cassia ................. 142, 144
Cisplatin .................................. 106–9, 115, 116, 117, 123, 136, 142–3
Cissampelos pareira ................... 86
Citrus aurantium ....................... 146, 155
Citrus reticulata ....................... 86
Clerodendron serratum .............. 85
Clinical medicine ..................... 5, 96
Clitoria ternatea ....................... 86
Index

Cocos nucifera .............................................. 86
Codonopsis pilosula ....................................
.............................................................. 75, 136, 141, 149
Coenzyme Q10 ........................................... 107, 112, 117
Coicis lachrymagobi ................................
.............................................................. 142, 143, 145, 147, 149, 150, 159
Colchicines .................................................. 146
Cold Syndrome of Excess .......................... 182
Colon/rectum cancer ...................................
Andrographalide ........................................ 108
Ayurvedic herbs .......................................... 89
Fago-c .......................................................... 79
5-Fu and panax notoginseng .................. 120
five-year disease-free survival rates
.............................................................. 31, 34
hou po .......................................................... 80
incidence ..................................................... 35–6
jiang huang .................................................... 81
jin qiao mai ...................................................... 79
mortality ..................................................... 35–6
Colonic irrigation ......................................... 50
Complementary alternative medicine (CAM) ...
adverse effects ........................................... 15
cancer and .................................................. 65–8
cancer clinic, use in .................................. 172–3
cancer definition ....................................... 67
cancer treatment ....................................... 90–6
categories ..................................................... 9–11
codification, lack of ..................................... 66
diagnostic tools ........................................... 66
functional medicine ..................................... 51–2
homeopathy ............................................... 52, 95
interactions with chemotherapeutic agents .... 14
interactions with prescription medicines .................................................................. 15–16
lack of scientific testing ............................ 13
naturopathy ................................................. 50–1, 66–7
orthodox medicine compared .................
................................................................ 67–8
rational vs empirical medicine ...............
........................................................................ 67–8
regulation by Therapeutic Goods
Administration ........................................... 15
research ....................................................... 13–14, 65, 178
therapeutic activity ..................................... 16
use by cancer patients ............................. 4
Western herbal medicine ...................... 51
Complex natural products ................. 11
Compound Tian Xian Capsule ............. 140
Compounds ................................................. 12, 91–2
chemotherapy and ..................................
......................................................... 94–5, 106–9, 113–25
radiotherapy and ..................................... 109–13
Conch shell ash .......................................... 85
Constipation ................................................. 146, 151, 155
Copper/zinc superoxide dismutase (SOD) .
................................................................. 111–2
Coptis chinensis ............................................ 143, 145, 148, 150, 153
CoQ10 ......................................................... 107, 112, 117
Cordyceps sinensis ...................................... 137, 141
Cori asini ...................................................... 136
Coriolus versicolor ........................................
.............................................................. 116, 117, 119, 122
Cornus Bubalus bubalis ......................... 150
Cornus officinalis .................................. 147, 157
Cornus Saiga tatarica ................................. 150
Cortex Cinnamomum cassia .................. 144
Cortex Eucommiae ulmoidis ............... 137, 142
Cortex Fraxinus rhynchophylla ............ 137, 149
Cortex Lycium chinense ......................... 151
Cortex Magnolia officinalis .................. 147, 157
Cortex Morus alba ................................. 147, 160
Cortex Paeonia suffruticosa ............... 147
Cortex Phellodendron chinense ...........
.............................................................. 143, 148, 149
Cortex Radicis Moutan ......................... 145, 150, 151
Corydalis tertschaninovii ....................... 148

199
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of health care............ 172–3</td>
</tr>
<tr>
<td>Cough.......................... 147, 159–62</td>
</tr>
<tr>
<td>Cranberry juice ................. 16</td>
</tr>
<tr>
<td>Crataegus pinnatifida........... 152, 164</td>
</tr>
<tr>
<td>Crotalaria sessiliflora......... 83</td>
</tr>
<tr>
<td>Cu Fei.......................... 83</td>
</tr>
<tr>
<td>Cucumis memordica............. 86</td>
</tr>
<tr>
<td>Curcuma aromatica ........... 81, 149</td>
</tr>
<tr>
<td>Curcuma domestica............ 86</td>
</tr>
<tr>
<td>Curcuma longa ................ 81, 88</td>
</tr>
<tr>
<td>Curcuma venyujin............... 141</td>
</tr>
<tr>
<td>Curcuma zeloariae............. 193</td>
</tr>
<tr>
<td>Curcumin ...................... 91, 110–1, 117, 119</td>
</tr>
<tr>
<td>Curculigo orchioides.......... 142</td>
</tr>
<tr>
<td>Cuscuta chinensis.............. 75, 137, 141, 147, 158</td>
</tr>
<tr>
<td>Cyclophosphamide.............. 117, 125</td>
</tr>
<tr>
<td>Cyclophosphane................ 139–40, 144</td>
</tr>
<tr>
<td>Cynomorium songaricum ....... 137, 142</td>
</tr>
<tr>
<td>Cyperus rotundus.............. 146, 151, 156</td>
</tr>
<tr>
<td>Cytarabine .................... 116</td>
</tr>
<tr>
<td>Cytotoxic therapies ........... 89, 94–5</td>
</tr>
<tr>
<td>DHA essential fatty acids .... 121, 122</td>
</tr>
<tr>
<td>Dhanvantari.................... 189</td>
</tr>
<tr>
<td>Dhatu........................... 189</td>
</tr>
<tr>
<td>Di Gu Pi........................ 151</td>
</tr>
<tr>
<td>Di Yu ........................... 149</td>
</tr>
<tr>
<td>Diagnostic tools ............... 66</td>
</tr>
<tr>
<td>Diarrhoea ...................... 145, 152–5</td>
</tr>
</tbody>
</table>
| Diet
  improper, effect ........... 37, 40 |
  oncogenes, effect on.......... 27 |
  supplements.................... 10, 12 |
  Diets........................... 10 |
| Digestive cancer ............... 77 |
| Digestive enzymes ............. 112 |
| DIM/I3C ......................... 91, 112 |
| Dioscorea bulbifera........... 76, 141 |
| Dioscoreae oppositae ......... 145, 153 |
| Dipaniya........................ 189 |
| Disturbance of the spirit ...... 183 |
| Diuretic ........................ 189 |
| DNA/RNA mutations ............ 28 |
| DNA synthesis .................. 92 |
| Docetaxel ....................... 115 |
| Dolichos lablab................ 145, 153 |
| Dong Chong Xia Cao........... 137, 141 |
| Dong Gua Ren................... 147 |
| Dong Ling Cao.................. 83 |
| Doshas of Ayurveda............ 49–50, 83–4, 86, 189 |
| Docorubicin (DOX) ............ 106, 107, 116, 117, 123, 124 |
| Dravya .......................... 189 |
| Du Zhong....................... 137, 142 |
| Dukkha (doo-k-kha)........... 189 |
| E
| E Jiao........................... 136, 141 |
| E Zhu ........................... 78 |
| Echinacea ...................... 15, 123 |
| EGCG (epigallocatechin-3 gallate) ..
Index

5-Methyl-tetrahydrofolate .......... 122
Five great elements ................. 48–50
Flos Chrysanthemum indicum .. 148
Flos Chrysanthemum morifolium ..
........................................ 147, 159
Flos Lonicera Japonica .......... 141, 142, 148, 150, 151
Flos Sophora japonica .......... 149
Floxyuridine ........................ 119–20
Fluorouracil ........................ 119–20
Foeniculi vulgaris ................. 81, 146, 156
Folate/folic acid ................... 92, 122
Folium Eriobotrya praeparata .. 149
Folium Morus alba ................. 141
Folium Perilla frutescens ....... 150
Food stagnation ................... 183
Forsythia suspense ............... 148
Fragaria indica ..................... 138
Fraxinus rhynchophylla ......... 147, 149
Fritillaria cirrhosa ............... 147, 160
Fritillariae thunbergii .......... 79
Fructus Alpinia oxyphylla .... 137
Fructus Amomum villosum ....
........................................ 145, 152
Fructus Citrus aurantium ....... 146
Fructus Cornus officinalis .. 147, 157
Fructus Crataegus pinnatifida ..
........................................ 152, 164
Fructus Evodia rutaecarpa ..... 149, 167
Fructus Foeniculi vulgaris .... 146, 156
Fructus Forsythia suspense .... 148
Fructus Gardenia jasminoidis ..
........................................ 146, 147, 156
Fructus Hordeum vulgaris .. 152, 164
Fructus Immaturus Citrus aurantium
........................................ 146, 155
Fructus Ligustrum japonicum .. 141
Fructus Ligustrum lucidum ..
........................................ 141, 144, 158, 168
Fructus Lycium chinensis ..
136, 138, 141, 147, 152, 159, 166, 167
Fructus Melia toosendan ....... 149

F

Fagopyrum cymosum extract (Fago-c) .................. 79
Fatigue ........................... 147, 157–9
Fibrosarcoma ..................... 74, 87, 88
Ficus glomerata .................. 86
Fish oil .......................... 119
5-Fu .......................... 119–20, 143, 144–5
Fructus Mori albi.......................... 137
Fructus Polygonum orientalis........ 138
Fructus Psoralea corylifolia ......... 137, 141, 147
Fructus Trichosanthis kirilowii...... 147, 162
Fruit Ligustrum lucidum.............. 137, 138, 141, 147, 152, 165
Fu Ling.................................... 141, 144, 145, 148, 149, 151, 154, 166, 167
Fu Zheng Therapy (FZT)......... 136–37
Fulminant hepatic failure.......... 14
Functional medicine (FM)........ 41–2

G
Gamma-linolenic acid............... 123
Gan Cao............................. 141, 148, 150
Ganoderma lucidum... 74, 114, 138
Gardenia jasminoidis .. 146, 147, 156
Garlic.................................. 16, 87, 123
Gastritis............................... 148
Gastro-intestinal tumors....... 109
Ge Gen.................................. 145, 154
Gelatinum Corii Asini............ 136
Gemcitabine.......................... 120
Gene therapy.......................... 5, 7
Genistein......................... 91, 122, 124
Ginger.................................. 16, 86, 189, 193
Ginkgo biloba......................... 123
Ginseng................................ 16, 116, 123
alcohol extracted.................. 106
Panax ginseng........................ 16, 74, 125, 136, 141, 144
Panax notoginseng................. 120, 148
Gleditsia Sinensis.................. 82
Glehnia littoralis................... 147, 160
Glucosamine.......................... 16
Glutamine............................. 10, 110, 119, 123
Glycyrrhiza glabra............... 85
Glycyrrhiza uralensis.. 141, 148, 150
Gong fa.............................. 72–3, 76–2
blood activating..................... 73, 78
coursing liver qi stagnation and
melancholia.......................... 73, 81
qi regulating and phlegm
eliminating.......................... 73, 79–80
softening lumps and dispelling
nodules............................... 73, 82
toxic heat removing............. 73, 76–7
Gou Qi Zi............................. 136
138, 139, 141, 147, 152, 159, 166, 167
Granthi (minor neoplasm)........ 47, 84, 85–6
kapaja granthi....................... 85
paittika granthi..................... 85
vatika granthi....................... 85
Grape seed extract............... 106, 123
Green tea............................ 142
Gua Lou......................... 80, 146, 147, 155, 162
Guarana............................... 15
Gynandropis pentaphylla..... 85, 88
Gypsum.............................. 150

H
Hahn................................. 51
Hair analysis.......................... 66
Hair loss............................... 144
Hallmarks of cancer.............. 26–7
angiogenesis........................ 27
cell cycle/ growth signal autonomy
........................................ 26
evasion of apoptosis.............. 26
evasion of growth inhibitory
signals.................................. 26
invasion and metastasis.......... 27
unlimited replicative potential.. 26
Harringtonine....................... 83
He Shou Wu................. 136, 141, 147, 159
He Tao Shu Zhi.................... 77
Hedyotis diffusa................. 138, 141
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart</td>
</tr>
<tr>
<td>blood deficiency .................. 183</td>
</tr>
<tr>
<td>fire .................................. 136</td>
</tr>
<tr>
<td>qi deficiency .................... 44, 184</td>
</tr>
<tr>
<td>yang deficiency .................. 184</td>
</tr>
<tr>
<td>yin deficiency ................... 184</td>
</tr>
<tr>
<td>Heat dryness ..................... 39, 150</td>
</tr>
<tr>
<td>Heat syndrome of excess .......... 184</td>
</tr>
<tr>
<td>Heat toxin .......................... 38, 39, 136</td>
</tr>
<tr>
<td>........................ Ai Fu Kang removing .......... 138</td>
</tr>
<tr>
<td>chemotherapeutic agents as ... 136</td>
</tr>
<tr>
<td>gong fa removing .............. 73, 76–7</td>
</tr>
<tr>
<td>radiation as ..................... 136, 141</td>
</tr>
<tr>
<td>Heliotropium indicum ............. 88</td>
</tr>
<tr>
<td>Helloborus niger .................... 85</td>
</tr>
<tr>
<td>Hepatoma ............................ 87, 88, 89</td>
</tr>
<tr>
<td>Herba Agrimonia pilosa ............. 141</td>
</tr>
<tr>
<td>Herba Artemisa annua .............. 151</td>
</tr>
<tr>
<td>Herba Cynomorium songaricum .. ........................ 137, 142</td>
</tr>
<tr>
<td>Herba Dendrobium loddigesum .. ........................ 137, 148</td>
</tr>
<tr>
<td>Herba Dendrobium nobile ........... 141</td>
</tr>
<tr>
<td>Herba Epimedi sagittatum ......... ........................ 137, 141, 142, 143, 149, 152, 164</td>
</tr>
<tr>
<td>Herba Fragaria indica ............. 138</td>
</tr>
<tr>
<td>Herba Hedyotis diffusa ............. 141</td>
</tr>
<tr>
<td>Herba Leonurus heterophyllus .... ........................ 137, 141</td>
</tr>
<tr>
<td>Herba Lobeliae chinensis .......... 138</td>
</tr>
<tr>
<td>Herba Lophatherum gracile ......... ........................ 149, 150</td>
</tr>
<tr>
<td>Herba Portulaca oleracea .......... 149</td>
</tr>
<tr>
<td>Herba Rabdosia rubescens .......... 83</td>
</tr>
<tr>
<td>Herba Scutellariae barbatae ........ 138</td>
</tr>
<tr>
<td>Herba Solani nigri ................. 138</td>
</tr>
<tr>
<td>Herba Solidaginis ................. 168</td>
</tr>
<tr>
<td>Herbs ................................. 11, 12</td>
</tr>
<tr>
<td>abdominal pain, for ............. 155–7</td>
</tr>
<tr>
<td>Ayurvedic ............................ 83–90</td>
</tr>
<tr>
<td>chemotherapy and .......... 14, 113–25</td>
</tr>
<tr>
<td>Chinese ............................... 72–83, 136–68</td>
</tr>
<tr>
<td>constipation, for .................. 155</td>
</tr>
<tr>
<td>cough, for ........................... 159–62</td>
</tr>
<tr>
<td>diarrhoea, for ..................... 152–5</td>
</tr>
<tr>
<td>effect on cancer cell lines ...... 93</td>
</tr>
<tr>
<td>fatigue, for ......................... 157–9</td>
</tr>
<tr>
<td>interactions with .................</td>
</tr>
<tr>
<td>chemotherapeutic agents ..........</td>
</tr>
<tr>
<td>........................................ 14, 113–25</td>
</tr>
<tr>
<td>interaction with prescription</td>
</tr>
<tr>
<td>medicines ............................ 15</td>
</tr>
<tr>
<td>post operative recovery, for .. 162–6</td>
</tr>
<tr>
<td>research ............................. 13–14</td>
</tr>
<tr>
<td>side effects ....................... 13–14</td>
</tr>
<tr>
<td>therapeutic activity .............. 16</td>
</tr>
<tr>
<td>Western herbal medicine ........ 50</td>
</tr>
<tr>
<td>Hericium erinaceus ............... 114</td>
</tr>
<tr>
<td>Hesperitin ........................... 153, 156</td>
</tr>
<tr>
<td>Hodgkin lymphoma .................. 32, 33</td>
</tr>
<tr>
<td>Homeopathy .......................... 52, 95</td>
</tr>
<tr>
<td>Homoharringtonine ................. 83</td>
</tr>
<tr>
<td>Hordeum vulgari ..................... 152, 164</td>
</tr>
<tr>
<td>Hormonal therapy ................. 6</td>
</tr>
<tr>
<td>Hou Po ............................... 80, 146, 157</td>
</tr>
<tr>
<td>Hoya viridiflora ..................... 85</td>
</tr>
<tr>
<td>Hrudya (hrud-dya) .................. 190</td>
</tr>
<tr>
<td>Hu Zhang ............................. 138</td>
</tr>
<tr>
<td>Huai Hua ............................. 149</td>
</tr>
<tr>
<td>Huang Bo ............................. 143, 148, 149</td>
</tr>
<tr>
<td>Huang Jing .......................... 137, 141, 151, 166</td>
</tr>
<tr>
<td>Huang Lian .......................... 83, 143, 145, 148, 150, 153</td>
</tr>
<tr>
<td>Huang Qi, ........................... 74, 136, 138, 139, 141, 142, 144, 148, 149, 150, 151, 163, 167</td>
</tr>
<tr>
<td>Huang Qin ........................... 145, 146, 147, 154, 157, 162</td>
</tr>
<tr>
<td>Huang Yao Zi ......................... 76, 141</td>
</tr>
<tr>
<td>Human epidermal carcinoma ...... ............... 87, 88, 89</td>
</tr>
<tr>
<td>Human neuroectodermal tumours .. ................................. 87</td>
</tr>
<tr>
<td>Hygrophila spinosa ................. 88</td>
</tr>
<tr>
<td>Hypericum perforatum ............</td>
</tr>
</tbody>
</table>
I

Iatrogenic illness ....................... 13
Ifosfamide ................................ 121
Immaturus Citrus aurantium .......... 146, 155
Imperata cylindrical ................. 150
Indian medicine
see Ayurvedic medicine
Indirubin .................................. 91, 108
Inflammation ................................ 28
Integrative oncology ................. 4
Interventions ............................. 5
Intestinal metaplasia ................ 81
Iridology .................................. 66
Irinotecan ................................ 121, 122
Irisquinone ............................... 83
Ixora undulata ............................ 88

J

Jasminum grandiflorum ................. 86
Ji Xue Teng .............................. 137, 141, 151
Jiang Can ................................ 82
Jiang Huang ............................ 81
Jiao Mai Ya ............................. 152, 164
Jiao Shan Zha ........................... 152, 164
Jiao Shen Qu ............................ 152, 166
Jie Geng ................................. 147, 150, 161
Jin Qiao Mai .............................. 79
Jin Yin Hua 141, 142, 148, 150, 151
Jing ......................................... 136
collapse .................................. 39
deficiency ................................ 184
Ju Hua ..................................... 147, 159
Ju Pi ........................................ 149
Juglans regia ............................. 77
Juniperus indica .......................... 88

K

Kapaja granthi ........................... 85
Kapha ................................. 49, 50, 84, 190
Kaphaja arbuda ......................... 86
Kaphaja neoplasm ..................... 49
Karma ...................................... 190
Karnofsky ................................ 5
Ke Li see Ai Fu Kang
Keshya (key-shya) ..................... 190
Khichadi (khi-cha-di) ................. 190
Kidney
Ai Fu Kang .............................. 138
Ayurvedic herbs ......................... 89
boosting .................................. 151
cancer ................................. 31, 34, 89
damage, reducing ..................... 116
deficiency with cold damp
accumulation ........................... 149
Er Zian Tang ............................. 144
qi deficiency ............................ 44
silibinin, effect on ..................... 108, 116
TCM, in ................................. 39, 41, 42
tonifying ............................... 144
weakening jing and yang .......... 136
yang deficiency ......................... 43, 184
yin deficiency ......................... 39, 42, 185
Kinesiology ............................. 66
Kneipp ................................... 51

L

L-carnitine .............................. 117, 121
L-glutamine ............................. 110, 123
L-glutathione ............................ 114
Lagenaria vulgaris ..................... 85
Lai Fu Zi ................................ 150
Large intestine
damp heat ............................... 45
Index

toxins in .......................................... 45
Larynx cancer ................................. 31, 32
Lekhanecya ...................................... 190
Lentinar ............................................ 120
Leonurus heterophyllus ...................... 137
Lepidium apetalum .................. 147, 160
Leucoplakia ......................................... 81
Leukaemia
Ayurvedic herbs ......................... 87–9
CoQ10, .............................................. 107
Fago-c and leukocytes ............. 79
five-year disease-free survival rates .................................................. 33
jin qiao mai ...................................... 79
raktarbuda ........................................ 47
zao jiao ............................................. 82
leukocytes ......................................... 83, 143
Leukopenia ...................................... 143, 168
Lewis lung carcinoma ............. 75, 89
Lian Qiao ........................................... 148
Ligusticum wallichii ... 145, 146, 156
Ligustrum japonicum ............. 141
Ligustrum lucidum ...................... 137, 138, 141, 144, 147, 152, 158, 165, 168
Linderae strychnifoliae ............. 81
Ling Yang Jiao .................................. 150
Ling Zhi .................................. 74, 138, 139
Liu Zhi Huang ................................. 168
Liver
adverse reactions to drugs ...... 13
adverse reactions to herbs ...... 15
affecting spleen ......................... 185
Ai Fu Kang .................................... 137–8
blood deficiency ......................... 185
cassia cinnamon, damaging ... 142
damp heat ...................................... 45
depressive heat ......................... 40
disharmony .................................. 148, 151
purification therapy ................. 50
qi stagnation .................. 39, 44, 81, 185
TCM, in .................................. 39, 40, 41
virechana (purification) ........... 50
yang repletion ................. 43
yang uprising ..................... 185
yin deficiency .................. 39, 42, 185
Liver cancer
Ai Fu Kang .................................... 137
Ayurvedic herbs ......................... 89
Fago-c and .................................. 79
hou po ............................................. 80
incidence .................................. 35
jiang can ...................................... 82
jin qiao mai ................................... 79
shan dou gen ......................... 76
lobeliae chinensis .................... 138
Long Kui ........................................ 138
Lonicera Japonica .................. 141, 142, 148, 150, 151
Lophatherum gracile ........... 149, 150
Lu Gen ............................................. 147, 160
Luffa cylindrica ......................... 88
Lumps and nodules
Ai Fu Kang dissolving ............ 138
gong fa softening ..................... 82
Lung
damp heat .................................... 45
dryness ........................................ 147
heat .............................................. 186
phlegm accumulation ............. 45
qi deficiency ...................... 43, 186
TCM, in .................................. 40, 41
Vitamin A reducing inflammation .................................................. 109
yin deficiency .................. 42, 186
Lung cancer
Ai Fu Kang .................................... 137
Ayurvedic herbs ......................... 89
Fago-c and .................................. 79
five-year disease-free survival rates ........................................ 31–4
Fu Zheng Therapy (FZT) .... 136–37
hou po ............................................. 80
jin qiao mai ................................... 79
Lewis lung carcinoma .................. 75, 89
Index

Melatonin ..............................108–9
Mortality ..................................35–6
Tian Dong ..................................75
Vitamin A ..................................93
Lycium chinensis ......................136, 141, 147, 151, 152, 159, 166, 167
Lymphoblastic leukaemia ..........107

M

Ma Chi Xian ..............................149
Ma Lin .......................................83
Magnesium ..............................116, 121
Magnolia officinalis .........80, 146, 157
Mai Dong ....................................137, 141, 146, 147, 148, 149, 150
Majja ...........................................190
Malas ..........................................190
Mansa ..........................................190
Manipulative/body-based methods .10
Mao Zhua Cao ............................138
Marmas .......................................191
Massa Fermentae .....................152, 166
Massa fermentata ......................146, 157
Meda (may-da) ............................191
Medical oncology (MO) .........4–5, 24
Medoja arbuda ............................86
Melanoma .................................47, 75, 89
Melatonin (MLT) .................108–9, 116, 117, 120, 121, 123, 124
Melia azedarach .........................88
Melia toosendan .........................149
Metastasis ..................................5, 24–28, 30
Methionine ..................................92
Methotrexate .........................122, 124
Millettia dielsiana .......................141
Mind-body interventions ........10
Mitomycin ..................................143
Mitoxantrone .........................107–9
Mo Yao .......................................146, 157
Moksha ......................................191
Monocrotaline .........................83
Morinda officinalis ..........142, 143
Moringa oleifera .........................88
Morus alba ..........................141, 147, 160
Mouth dryness .................148, 150
Ulcers ......................................148
Wash ........................................148
Mu Dan Pi ..........................145, 147, 150, 151
Mu Xiang ...............................149, 151
Muller ...........................................5
Multi-drug resistance (MDR) .........106–7, 108
Multigenesis .............................30
Multi-site cancers (MSCs) .........30
Musa paradisiaca .........................85
Musa sapientum .........................85
Myristica fragrans .....................150
Myrrha .......................................146, 157

N

N-acetylcysteine .114, 115, 117, 121
Nan Sha Shen .........................149
Nasopharyngeal carcinoma ........87–9, 143
Nasya (nose cleaning) .........49, 50, 191
Naturopathy .........................50–1, 66
cancer and .........................67
cancer treatment .....................90
causes of diseases ..................66
codification, lack of ...................66
diagnosis ..................................66
Nerium indicum ........................89
Nerium odorum ........................86
Nigella sativa ............................89
Non-Hodgkin lymphoma .......32, 107
Non-steroidal anti-inflammatory
drugs ..................................14, 109
Nong Ji Li ..................................83

206
Nose cleaning ......................................... 49, 50
Notopterygium incisum ................................... 145, 153
Nowell and Hungerford ................................. 5
Nu Zhen Zi .................................................. 137, 138
Nutraceuticals ............................................ 11–12, 73
Nutrition medicine ........................................ 51–2
Nutritional therapeutics .................................. 10

O

Ocimum sanctum ........................................... 89
Oesophagitis .................................................. 148
Oesophagus cancer ......................................... 32
Ojas ............................................................. 191
Oldenlandiae diffusa ...................................... 138, 141
Oleic acid ...................................................... 123
Omega ........................................................... 3, 125
Oncogenes ..................................................... 25, 27, 29
1158 ............................................................ 82
Ophiopogon japonicus ................................. 137, 141, 146, 147, 148, 149, 150
Oral cancer ................................................... 31, 33, 34, 47
Oridonine ....................................................... 83
Orthodox medicine (OM) ................................. 4, 24–36, 72
adverse reactions to drugs .......................... 13
CAM compared ............................................. 67–8, 96
cancer definition .......................................... 24–8
cancer treatment ......................................... 72
definition ..................................................... 4
issues in oncology ....................................... 29–36
rational vs empirical medicine ................. ......................... 67–8
spending on ............................................... 12
therapeutic compounds used in support .............. 12, 174
Ovarian cancer
Ayurvedic herbs ............................................. 89
Fago-c and ................................................. 79
five-year disease-free survival rates ..

P

Paachaneeya ................................................... 191
Paclitaxel ..................................................... 106, 109, 117, 123
Paederia foetida ............................................. 89
Peonia lactiflora ........................................... 145, 146, 147, 148, 149, 151, 153, 157
Peonia suffruticosa ........................................ 147
Peoniae lactiflorae ........................................ 149, 157
Pattika granthi ............................................... 85
Panacis Quinquefolii ...................................... 167
Panama glabra .............................................. 86
Panax ginseng ..............................................
....................................................... 16, 74, 125, 136, 141, 144
Panax notoginseng .................................... 120, 148
Panchakarma .............................................. 50, 181, 191
Pang Da Hai ................................................. 150
Papanicolaou .............................................. 5
Paris polyphylia .......................................... 77
Paullinia cupana .......................................... 15
Pericarpium Citrus reticulata ......................... 145, 146, 149, 151, 152, 155
Perilla frutescens .......................................... 150
Pharmacological treatments ......................... 11
Phellodendron chinense .................................
....................................................... 143, 148, 149
Philadelphia chromosome ............................ 5
Phlegm ........................................................ 183
accumulation .................................................... 39, 45, 186
gong fa eliminating ................................... 72–3, 79–80
heat, cough due to ...................................... 147
stagnation .................................................... 39
Phragmitis communis .................................. 147, 160
Phytochemicals ........................................... 91
Picrorrhiza kurroa ......................................... 89
Pinella ternata ............................................. 150
Ping Xiao Pian .......................................... 140
Index

Pitta........................................49, 50, 84, 192
Pittaja arbuda.............................86
Pittaja neoplasm..........................49
Platycodon grandiflorum.....................147, 150, 161
Plumbago zeylanica..........................89
Pollen Myrrha.................................146
Pollen Typha angustifolia.....................146
Polygonatum kingianii.......................86, 147, 150, 161
Polygonatum odoratum........................141
Polygonatum sibiricum........................141
Polygonum bistorta............................138
Polygonum cuspidatum........................138
Polygonum multiflorum........................136, 141, 147, 159
Polygonum orientalis..........................138
Polytopor um umbellatum......................141
Polysaccharide-K..............................116, 117, 122
Polysaccharides..................................114
Pongamia glabra...............................85
Poria cocos.....................................141
Prakruti.........................................192
Premna herbacea...............................86
Prescription drugs
adverse reactions to..........................13
herb/supplement interactions...............15
off-label use..................................11
orthodox medicine...........................4
Pressnitz..........................................50–1
Probiotics........................................52, 111, 119–20
Proctitis..........................................149
Prostate cancer
DIM/I3C........................................91
Fago-c and......................................79
five-year disease-free survival rates..............31, 32
incidence........................................35–6
Indirubin.........................................91
mortality........................................35–6
Quercetin........................................91
Vitamin D3.......................................93
Proto-oncogenes...............................25, 27, 28
Prunus armeniaca...............................146, 148, 155, 161
Prunus persica.................................146, 147, 161
Pseudostellaria heterophylla...................141, 149, 151, 166
Psoralea corylifolia.............................137, 141, 147
Pu Huang........................................146
Pueraria lobata.................................145, 154
Pulsatilla chinensis..............................145, 149, 154
Purgation therapy...............................50

Q

Qi..................................................38–9
Ai Fu Kang.................................137–8
chemotherapeutic agents
   damaging.......................................136
deficiency/vacuity (xu).........................39, 43, 145, 186
depression.........................................38–9
essence (jing) collapse and....................39
   Fu Zheng Therapy (FZT)....................136–7
   heart qi deficiency..........................44, 184
   invigorating....................................144
   kidney qi deficiency.........................44
   liver qi stagnation..........................44, 73, 81, 185
   lung qi deficiency............................43, 186
   qi and blood deficiency......................39, 186
   radiotherapy damaging.....................141
   regulating, gong fa.........................73, 79–80
   spleen qi deficiency........................38, 40, 44, 145, 187
   stagnation......................................39, 44, 146, 186
   supplementing................................151
   Vital-qi.........................................137–40
   Qiang Huo....................................145, 153
   Qin Pi..........................................147, 149
Qing Hao ........................................ 151
Quan Shen ........................................ 138
Quercetin ........................................ 91, 117, 123

R

Radiation sickness ................................. 109
Radiation therapy .................................. 5–6
Ai Fu Kang formula .................. 137–41
alkylglycerols following .......... 109–10
antioxidants and ......................... 94
Chinese medicine, adjunctive treatment .................................. 137–41
compounds used with .......... 109–13
five-year disease-free survival rates ........................................ 32–4
gong fa ............................................. 73
heat toxin created by .......... 136, 141
side effects, treating ........ 142–52
supplements used with .......... 109–13
yin damaged by ......................... 141
Radis Moutan .............................. 145, 150, 151
Radix Adenophora tetraphylla .. 149
Radix Albus Peonia lactiflora ... ........................................ 145, 148, 153
Radix Angelica sinensis ......... 136, 138, 141, 143, 144, 145, 146, 148, 151, 162
Radix Asparagus cochinchnensis ... ........................................ 141, 147, 159
Radix Astragalus membranaceus .... ........................................ 141, 147, 159
Radix Aucklandia lappa .......... 149, 151
Radix Bupleurum chinensis ........ .......................... 146, 147, 148, 150, 151, 166, 167
Radix Codonopsis pilosula........ .......................... 136, 141, 149
Radix Curcuma aromaticata ...... 149
Radix Curcuma venyujin ................. 141
Radix Dioscoreae oppositae .......... ........................................ 145, 153
Radix et Herba Salvia chinensis 138
Radix Glehnia littoralis .......... 147, 160
Radix Glycyrrhiza uralensis ....... ........................................ 141, 148, 150
Radix Ligustici wallichii ................. ........................................ 145, 146, 156
Radix Morindae officinalis ......... ........................................ 137, 142, 143
Radix Ophiopogon japonicus ...... .......................... 137, 146, 147, 148, 149, 150
Radix Paeonia lactiflora ................. ........................................ 146, 147, 148, 149, 151, 157
Radix Paeoniae lactiflorae .. 149, 157
Radix Panacis Quinquefolii ...... 167
Radix Panax ginseng ................. 136, 144
Radix Panax notoginseng ......... 148
Radix Platycodon grandiflorum ... ........................................ 147, 150, 161
Radix Polygonum multiflorum .... .......................... 136, 141, 147, 159
Radix Pseudostellaria heterophylla .... .......................... 141, 149, 151, 166
Radix Puerariae lobatae ......... 145, 154
Radix Pulsatilla chinensis ......... ........................................ 145, 149, 154
Radix Ranunculus ternatus ....... 138
Radix Rehmannia glutinosa ....... ........................................ 136, 138, 141
Radix Scrophularia ningpoensis .. ........................................ 136, 146, 147, 148, 150, 151, 166, 167
Radix Scutellaria baicalensis ... ........................................ 145, 146, 147, 148, 150, 151, 157, 162
Radix Sanguisorba officinalis .... 149
Radix Scrophularia ningpoensis ... ........................................ 146, 147, 148, 150
Radix Scutellaria baicalensis ... ........................................ 145, 146, 147, 148, 150, 151, 157, 162
Radix Stemona sessilifolia .. 148, 162
Radix Trichosanthes kirilowii .... ........................................ 147, 148, 149, 150
Radix oxa ........................................... 192
Radix-mokshana .............................. 49, 50, 192
Randia dumetorum ......................... 85
Index

Ranunculus ternatus .................. 138
Raphanus sativus ..................... 150
Ras oncogenes or ras genes ........ 25
Rasa ...................................... 192
Rasayana ................................ 192
Rational vs empirical medicine 67–8
Rehmannia glutinosa . 136, 138, 141
144, 146, 147, 150, 151, 166, 167
Ren Shen ................. 74, 136, 141, 144
Renal 
  failure ....................... 122 
  function ....................... 121, 143
  lesions ......................... 142–3
Renji, Doctor ....................... 137
Renji Tumour-inhibiting Granules ..
  ........................................ 137
Resveratrol .......................... 91, 111
Retinoid ............................... 119
Retinol .................................. 109, 124
Retinol palmitate .................... 109
Rh2 .................................... 124
Rheum palmatum ......... 146, 155, 157
Rhizoma Alismatis orientalis ..
  ........................................ 146, 155
Rhizoma Anemarrhena
  asphodeloides ................. 143, 150
Rhizoma Atractylodes
  macrocephala .................. 149, 164, 167
Rhizoma Bletilla striata ....... 148
Rhizoma Cimicifuga heracleifolia ..
  ........................................ 150
Rhizoma Coptidis ................... 83
Rhizoma Coptis chinensis ..
  ........................................ 143, 145, 148, 150, 153
Rhizoma Corydalis tartschaninovii ..
  ........................................ 148
Rhizoma Curculigo orchioides .. 143
Rhizoma Cyperus rotundus ....
  ........................................ 146, 151, 156
Rhizoma Dioscorea bulbiferaus .. 141
Rhizoma Imperata cylindrical .. 150
Rhizoma Phragmitis communis ..... 
  ........................................ 147, 160
Rhizoma Pinellia ternata ........ 150
Rhizoma Polygonatum kingianum ..
  ........................................ 137, 151, 166
Rhizoma Polygonatum odoratum ..
  ........................................ 149
Rhizoma Polygonatum sibiricum ..
  ........................................ 141
Rhizoma Polygonum bistorta .... 138
Rhizoma Polygonum cuspidatum ..
  ........................................ 138
Rhizoma Rheum palmatum ..
  ........................................ 146, 155, 157
Rhizoma seu Radix
Notopterygium incisum .... 145, 153
Rhizome Atractylodes macrocephala ...
  ........................................ 141, 144, 145, 151, 152, 164
Ricinus communis ............... 86
Rou Dou Kou ....................... 150
Rou Gui ....................... 144
Rowley ....................... 5
Rubescensine A ............... 83
Rubia cordifolia ............... 89

S
Saiga tatarica ......................... 150
Saikosaponins ...................... 155
Salvia chinensis ............... 138
Salvia miltiorrhiza ............... 137, 142, 145, 150, 152, 154, 166, 167
San Leng ....................... 78
San Qi ....................... 148
Sang Bai Pi ....................... 147, 160
Sang Shen ....................... 137, 141
Sanguisorba officinalis .......... 149
Sarcomas .................. 25, 76, 80, 87, 88
Schwartz leukaemia ............. 88
Scientific knowledge ............ 8
Sclerotium Polyporum umbellatum .
  ........................................ 141

210
Index

Sclerotium Poria cocos.............. 141
144, 145, 148, 149, 151, 154, 166, 167
Scrophularia ningpoensis............... 146, 147, 148, 150
Scutellaaria baikalensis............ 145, 146, 147, 154, 157, 162
Scutellaaria barbatae................ 120
Selenium........................................ 93, 106
Semen Benincasa hispida............ 147
Semen Coicis lachrymajaobi........... 142, 143, 145, 147, 149, 150, 159
Semen Cuscuta chinensis.............. 137, 141, 147, 157
Semen Dolichos lablab.............. 145, 153
Semen Iris pallasii.................... 83
Semen Lepidium apetalum 147, 160
Semen Myristica fragrans........... 150
Semen Prunus armeniaca............. 146, 148, 155, 161
Semen Prunus persica 146, 147, 161
Semen Raphanus sativus............ 150
Semen Sterculia lynchophora........ 150
Semen Trichosanthis kirilowii....... 146, 155
Serootonin syndrome.................... 16
Sha Ren.......................... 145, 152
Shan Dou Gen......................... 76
Shan Yao.......................... 145, 153
Shan Zhu Yu......................... 147, 157
Shark liver oil...................... 109
She Mei........................... 138
Shen Qu.......................... 146, 157
Sheng Di........................... 146, 147, 148, 150, 151, 166
Sheng Ma.......................... 150
Shi Gao............................ 150
Shi Hu........................... 137, 141, 148
Shi Jian Chuan...................... 138
Shi Quan Da Bu Tang............... 144
Shi Di Huang......................... 136, 138, 141, 144, 167
Shui Hong Hua Zi................. 138
Shui Niu Jiao.......................... 150
Shukra.................................. 192
Si Jun Zi Tang...................... 144
Side effects of cancer treatments...... 145–68
Silibinin......................................
107–8, 115, 116, 117, 120, 124
Silybum marianum.............. 112–3
Skin cancer.............................. 89
SOD (superoxide dismutase)........ 111–2
Solani nigri.......................... 138
Sophora japonica.................... 149
Sophora tonkinensis............ 76
Soymida febrifuga................... 85
Sparganium stoloniferum........... 78
Spatholobus suberectus............ 137, 151
Sperm count........................... 136
Spiritual therapies.................... 11
Spleen
Ai Fu Kang.......................... 139
damp heat in............. 183
deficiency with cold damp
accumulation............ 149
disharmony........... 151, 187
fortification........... 144, 151
gua lou....................... 80
liver affecting........... 185
qi damage.................. 136
qi deficiency .. 40, 43, 44, 145, 187
Si Jun Zi Tang............... 144
yang deficiency........ 42, 187
yang weakening........... 136
yin deficiency.............. 40, 42
Sporophore Ganoderma lucidum....
74, 114, 138
St John’s wort........... 15, 122
Stem cells......................... 26, 28
Stemona sessilifolia............ 148, 162
Sterculia lynchophora........... 150
Stomach
cancer......................... 137
disharmony................ 148
Index

fire ........................................ 43
heat injuring yin ...................... 149
yang deficiency ..................... 43
yin deficiency ...................... 42, 187
Stomachitis .......................... 136, 142
Sukha .................................. 192
Sulphur ................................ 85
Suo Yang ................................. 137, 142
Supplements ........................... 10–11, 92–3
chemotherapy and ....... 94–5, 115–7
interactions with
chemotherapeutic agents ........ 14
interaction with prescription
medicines ............................. 15
radiotherapy and ..................... 118–9
side effects ........................... 13
therapeutic activity ................. 16
Surgical oncology ................. 24
Surgery ................................. 5
Ayurvedic procedures .......... 85–6
five-year disease-free survival
rates ..................................... 31, 33, 34
post operative recovery 151, 162–8
Symlocos racemosa ................. 86
Systemic therapy .................... 6

Tai Zi Shen .......... 141, 149, 151, 166
Tao Ren ..................... 146, 147, 161
Targeted therapy ................. 6
Taxanes ............................... 123
Taxus buccata ...................... 89
Tectona grandis ................... 86
Teng Li Gen ......................... 76
Terminalia arjuna ................... 86
Terminalia chebula ................. 85
Testicular cancer ....... 31, 32, 33, 121
Theanine ............................. 117, 122
Thioctic acid ......................... 125
Tian Dong ......................... 75, 141, 147, 159
Tian Hua Fen ....................... 147, 148, 149
Tian Men Dong ..................... 167
Ting Li Zi ............................. 147, 160
Tinospora cordifolia .............. 85
Topotecan ............................ 124
Toxic heat ............................ 38, 39
Ai Fu Kang removing .......... 139
gong fa removing ............... 73, 76–7
injuring yin ......................... 148
Toxins .................................. 66
Ai Fu Kang removing .......... 139
Ayurvedic medicine .......... 49
cancer toxins ....................... 40, 45
Kapha toxins ......................... 50
naturopathy ........................ 66
Pitta toxins ........................... 50
TCM ................................. 37, 40, 45
Vata toxins ......................... 49
Traditional Chinese medicine
(TCM) ..................................
...... 7, 9, 36–46, 72–83, 96, 136–68
Ai Fu Kang ......................... 137–42
blood see Blood
bu fa ................................. 72–3
cancer clinic, use in .......... 172–3
cancer definition ................... 38–46
cancer toxins ....................... 40
cancer treatment ................. 72–83
chemotherapy, adjunctive
treatment ......................... 136–42
cold syndrome of excess .... 182
damp heat ............................
...... 40, 45, 145, 146, 149, 153, 183
dampness ............................ 183
disease causes ..................... 36–8
disturbance of the spirit ........ 183
food stagnation ................. 183
Fu Zheng Therapy (FZT) .... 136–7
glossary of terms ............... 182–8
gong fa .............................. 72–3, 76–83
heart see Heart
heat syndrome of excess .... 184
heat toxins .................. 38, 39, 136
herbs ......................... 7, 72–83
historical and contemporary understanding .................. 36–8
integration into national health care systems ............. 172, 174, 178
interaction with chemotherapeutic agents .................. 14–6
jing ................................ 39, 136, 184
kidney see Kidney
liver see Liver
lung see Lung
organ functions .................. 41
organ patterns associated with cancer .................. 42–5
phlegm see Phlegm
qi see Qi
quantitative evaluation ........ 14, 96
radiotherapy, adjunctive treatment .................. 136–42
randomised controlled trials ...... 14
research .................. 13, 172, 178
side effects of cancer treatments, treating .................. 142–52
spleen see Spleen
stomach see Stomach
toxic heat ........ 38, 39, 72–3, 76–7
treatments ........ 72–83, 136–68
upward rising heat .................. 43
wind heat with blood deficiency .................. 39
yang see Yang
yin see Yin
yin/yang theory .................. 46
Traditional complementary alternative medicine (T-CAM) ........
................................ 4, 11–12
cancer clinic, use in .......... 172–3
Chinese see Traditional Chinese medicine (TCM)
Indian see Ayurvedic medicine (AM)
integration into national health care systems ........ 172, 174, 178
orthodox medicine compared .................. 67–8, 96
Traditional medicines (TM) ........ 7–8
Trastuzumab .................. 124
Trichosanthes kirilowii ..............
................................ 80, 146, 147, 148, 149, 155, 162
Trikatu .................. 193
Triphala .................. 193
Triticum sativum .................. 86
Tu Si Zi ........ 75, 137, 141, 147, 158
Tuber Ophiopogon japonicus .... 141
Tubor Asparagus cochinchinensis ....
................................ 167
Tumour-node-metastasis (TNM) system ........ 5
Tumour response and patient performance status (KPS) .... 5
Tumour suppressor genes ........ 27, 28
Tumourigenesis ........ 25, 26, 27
Typha angustifolia .................. 146
Ubiquinone .................. 112
Upward rising heat .................. 43
Vinblastine ........ 124, 146
Vincarosea .................. 89
Vincristine .................. 116, 125
Virechana (purgation) ........ 49, 50
Vital-qi .................. 137–40
Vitalism .................. 50
Vitamin A .................. 93, 109, 122
Index

Vitamin B complex ................. 116
Vitamin B1 ............................... 124
Vitamin B6 .................. 92, 116, 124
Vitamin B12 ................................. 92
Vitamin C ................................ 94–5
Vitamin D3 ............................... 93, 106, 114, 115
Vitamin E ........................................ 93, 114, 118, 123, 124
Vitamin K ...................... 114, 118, 125
Vomiting and nausea .......... 149
Vrana ............................................. 85
Walker carcinoma .............. 87, 88
Western herbal medicine (WHM) .... 51, 66
Withania somnifera .......... 89, 117
Wu Yao ........................................ 81
Wu Zhu Yu ...................... 149, 167
Xanthium strumarium ........ 86
Xerostomia ............................. 150
Xi Yang Shen ................. 167
Xian He Cao ...................... 141
Xian Mao ................................. 143
Xiang Fu .................. 146, 151, 156
Xiao Hui Xiang .............. 81, 146, 156
Xing Ren .................. 146, 148, 155, 161
Xuan Shen .......... 146, 147, 148, 150
Yan Hu Suo ......................... 148
Yin
chemotherapeutic agents
damaging ............................... 136
deficiency/vacuity ........ 42, 43, 187
heart yang deficiency ....... 184
invigoration ......................... 46
kidney yang deficiency .... 42, 184
liver yang repletion ........... 43
liver yang uprising .............. 185
spleen yang deficiency ...... 43, 187
yin/yang theory ................ 46
Ye Ju Hua ................ 148
Yi Mu Cao .................... 137, 141
Yi Yi Ren .................. 143, 145, 147, 149, 150, 159
Yi Zhi Ren ..................... 137, 142
Z
Zao Jiao ............................... 82
Zao Xiu ............................... 77
Ze Xie ................... 146, 155
Zhang Congzheng .......... 73
<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhang Renji</td>
<td>137</td>
</tr>
<tr>
<td>Zhe Bei Mu</td>
<td>79</td>
</tr>
<tr>
<td>Zhi Ke</td>
<td>146</td>
</tr>
<tr>
<td>Zhi Mu</td>
<td>143, 150</td>
</tr>
<tr>
<td>Zhi Pa Ye</td>
<td>149</td>
</tr>
<tr>
<td>Zhi Shi</td>
<td>146, 155</td>
</tr>
<tr>
<td>Zhi Zi</td>
<td>146, 147, 156</td>
</tr>
<tr>
<td>Zhu Ling</td>
<td>141</td>
</tr>
<tr>
<td>Zhu Ru</td>
<td>149</td>
</tr>
<tr>
<td>Zhu Ye</td>
<td>150</td>
</tr>
<tr>
<td>Zi Cao</td>
<td>76</td>
</tr>
<tr>
<td>Zi Su Ye</td>
<td>150</td>
</tr>
</tbody>
</table>
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