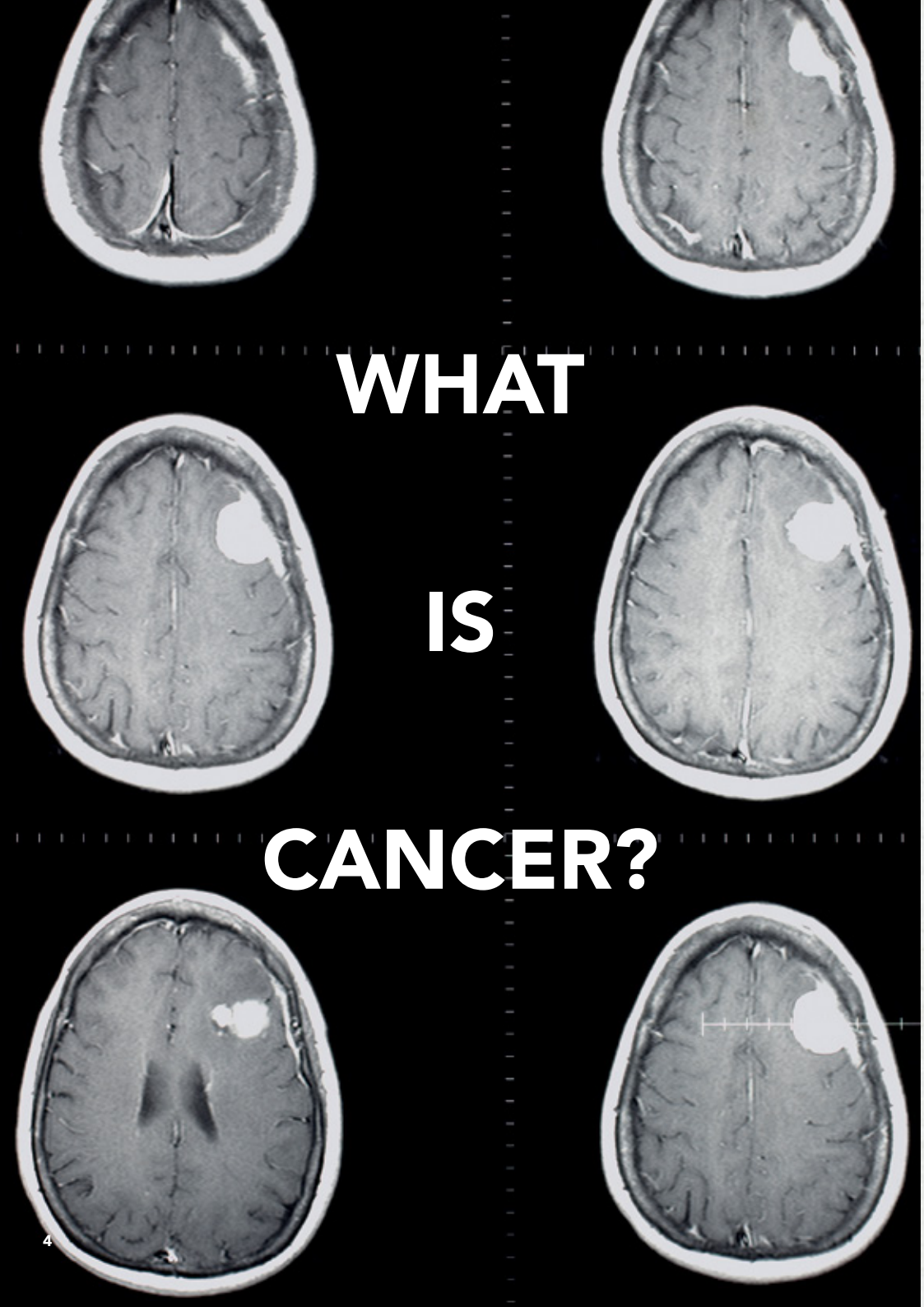
The silent killer

GREAT HEALTH
5
Hope Channel Course

WHAT WE DO KNOW ABOUT CANCER

"Cancer is one of the leading causes of death in Australia, killing more than **43,000** *people in 2011. Over* **100,000** *new cases are diagnosed each year, with that number set to rise to* **150,000** *by 2020."*[1]

WHAT IS CANCER?



Our cells are growing or renewing themselves everyday, with this process being controlled by the cells' genetic blueprint. If something causes a mistake to occur in this blueprint, cell growth can get out of control. Cancer is the word we use to describe the result of our body cells multiplying in an uncontrolled manner. The human body is continually making new cells (for growth and repair), but the process can become disorderly if damage occurs to the genes that control cell division. All cancers are caused by genetic damage—damage that can occur during our lifetime. The majority of damage is caused by environmental factors, such as lifestyle, environmental pollutants and radiation.

The damaged cells may grow into a mass of cells or a lump called a tumour. A tumour can be benign (not cancerous), meaning it doesn't spread to other parts of the body, or it can be malignant (cancerous), having the potential to spread and affect other body organs. Cancerous cells can originate from any type of body tissue, resulting in many different types of cancer.

When it first develops, a malignant tumour is confined to its original site. This is called the primary cancer. If left untreated, these cells may spread into surrounding tissues and then to other parts of the body via the blood stream or lymphatic system. The cells may continue to grow and form another tumour at the new site. This is called a secondary cancer or metastasis.[2]

WHAT CAUSES CANCER?

While some substances have been identified as cancer-causing agents (i.e. carcinogens that readily damage the DNA), the many causes for cancer are still being identified. Nevertheless, research has revealed a range of lifestyle behaviours that can raise or lower the risk for a variety of cancers.

About 30% of cancer deaths are attributed to five leading behavioural and dietary risk factors: 1) being overweight or obese, 2) low fruit and vegetable intake, 3) lack of physical activity, 4) smoking and 5) alcohol use.[3] In Australia, more than 13,000 cancer deaths each year are due to smoking, sun exposure, poor diet, alcohol, inadequate exercise or being overweight.[4]

According to the Cancer Council of Australia, there are five key behaviours people can adopt to have the greatest impact on reducing their risk of developing cancer:

- ✔ **DON'T SMOKE** (or if you do, quit)
- ✔ **DON'T DRINK ALCOHOL**
- ✔ **TAKE SENSIBLE SUN PROTECTION ACTION**
- ✔ **EAT WELL**
- ✔ **MOVE MORE**

These recommendations are in line with eight recommendations made by the World Cancer Research Fund (WCRF) in its 2007 Expert Report. This comprehensive publication was based on in-depth analysis of more than 7,000 scientific studies on cancer prevention published during the last 50 years.[5]

✔ DON'T SMOKE

With fewer than 20% of Australians now smoking,[6] most people have clearly got the message that smoking is a harmful habit. Tobacco smoke contains over 60 cancer-causing chemicals.[6] One example is Benzo(a)pyrene, which damages an important gene called the P53 gene.[7] The role of P53 is to prevent uncontrolled cell multiplication—or in other words prevent cancer.[8] When the gene is damaged by tobacco smoke it can no longer perform this crucial role.

Smoking is the greatest preventable cause of cancer, causing 20-30% of all human cancers.[9] It is estimated there are 1.5 million new cases of lung cancer each year worldwide, and approximately 85% of these are caused by tobacco smoking.[9-11] In 2005 there were over 8,000 deaths from smoking-related cancers in Australia, with over 5,700 being due to lung cancer. Smoking is also linked to many other cancers, including cancers of the mouth, larynx, oesophagus, bladder and anus.[12]

✔ DON'T DRINK ALCOHOL

Alcohol is a known cancer-causing substance. According to the Cancer Council of Australia, "Any level of alcohol consumption increases the risk of developing an alcohol-related cancer; the level of risk increases in line with the level of consumption." Further, "There is convincing evidence that alcohol use increases the risk of cancers of the mouth, pharynx, larynx, oesophagus, bowel (in men) and breast (in women), and probable evidence that it increases the risk of bowel cancer (in women) and liver cancer. Smoking and alcohol together have a synergistic effect on cancer risk, meaning the combined effects are significantly greater than individual risks added together."[13]

The Cancer Council encourages people to "Limit their consumption of alcohol, or better still avoid alcohol altogether"[10] if they want to reduce their risk of cancer. The World Cancer Research Fund (WCRF) in its 2007 Expert Report acknowledged that, "The evidence on cancer justifies a recommendation not to drink alcoholic drinks." The report also recognised that there is no known amount of alcohol that can be consumed without increasing your risk of cancer.[5]

But isn't alcohol good for your heart?

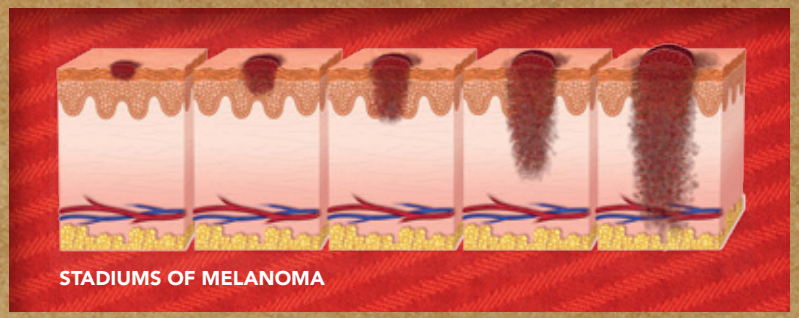
Much has been written about the possible heart-health benefits of drinking red wine. According to the Cancer Council, "There is evidence to suggest that drinking small amounts of certain types of alcohol, such as red wine, can reduce the risk of developing cardiovascular disease. Cancer risk, however, increases from the first alcoholic drink you have."[14,15 16]

Furthermore, a study published in Circulation, the journal of the American Heart Association, found that the flavonoids (a type of phytochemical) in purple grape juice likely protect against cardiovascular disease, even in the absence of alcohol. The researchers found that drinking purple grape juice reduced the likelihood of LDL cholesterol being oxidised—a key process in cardiovascular disease. Drinking grape juice also improved the ability of major blood vessels to expand when blood flow increases—another important factor in decreasing cardiovascular events such as heart attacks.[17] All this without any alcohol in sight!

✔ TAKE SENSIBLE SUN PROTECTION ACTION

Each year, nearly 2,000 Australians die from skin cancer[18]—a disease that is almost completely preventable. Australia has one of the highest rates of skin cancer in the world, with 2-3 times the rate found in Canada, the United States and the United Kingdom.[19,20] Nearly all skin cancers are caused by exposure to the ultraviolet (UV) radiation in sunlight. In particular, 95% of melanomas—the most deadly form of skin cancer—are caused by sunburn.[21] For the best chance of preventing skin cancer, use a combination of sensible sun protection measures:

- Cover up with clothing
- Use sunscreen
- Wear a hat and sunglasses
- Spend time in the shade
- Be cautious between 10am and 3pm when UV levels are at their peak.[21]



Deadly Melanomas

Melanoma is caused mainly by intense, occasional UV exposure (frequently leading to sunburn), especially in those who are genetically prone to the disease.[22]

If you suspect you have a melanoma, see your doctor urgently. Don't put it off or just keep thinking about doing it. If not recognised and treated early, melanoma can develop and spread rapidly to other sites around the body where it can be hard to treat and become fatal. While it is not the most common of the skin cancers, it accounts for the 75% of skin cancer deaths.[22,23]

The acronym ABCDE, is used for recognising melanomas, the most important sign to look out for is 'new or changing skin lesion':[24,25]

A symmetrical mole, brown spot or growth on the skin

B order of the spot is uneven, scalloped or notched

C olour—the spot has multiple or unusual colours

D iameter is usually larger than 6mm (but can initially be smaller)

E volving—changing size, shape, colour or any other feature

✔ EAT WELL

What does it mean to eat well in the context of cancer prevention? There are four key principles to follow:

1. EAT MORE PLANT FOODS

Fruit and vegetables are rich in fibre, vitamins, minerals, anti-oxidants and phytochemicals, all of which act in the body to help protect against cancer.

It is likely that these nutrients work in together, rather than individually, to reduce cancer risk. Fruit and vegetables contain varying amounts and types of these nutrients, so variety is the key. Fruit choices should include citrus, berries, and red, orange and yellow-coloured fruit. A variety of vegetable types should be consumed, including cruciferous (e.g. broccoli), allium (e.g. onions, leeks), dark green leafy vegetables, and red, yellow and orange-coloured vegetables.

It is wise to eat both raw and healthfully cooked vegetables, as there are some cancer-fighting agents which are absorbed better from cooked fruit or vegetables.[26,27]

Interestingly, some of the starch in whole, unprocessed plant foods is not digested by human enzymes and is instead fermented by bacteria in our large intestine. The fatty acids produced by this bacterial action are important for bowel health and may protect against bowel cancer.[28]

The WCRF Expert Report recommended eating:

- at least five serves (400g) of vegetables and fruits every day
- unprocessed grains and/or legumes with every meal
- limited amounts of refined, starchy foods

According to the report, most diets that have cancer-protective agents are made up mostly of plant foods.[5]

What about soy?

Does soy cause breast cancer? Or does it protect against it? There has been much confusion over this issue in the minds of the general public. The concern arose in part because of the fact soy contains isoflavones which are similar to oestrogens. This caused unease because oestrogens are known to be linked to hormonally-sensitive cancers such as breast cancer. However, the potency of isoflavones in soy is only a fraction of human oestrogen, and soy isoflavones also have anti-oestrogen, anti-oxidant and anti-inflammatory properties, all of which work to reduce cancer risk. Studies in humans to date have clearly demonstrated that no harm is caused by eating soy foods—both in the general population and in breast cancer survivors. This statement doesn't necessarily apply to soy supplements.[29]

Moderate consumption of soy foods may even lower cancer risk, but this is not certain from the relatively low amounts of soy that Westerners eat. A recent review of the research concluded that the amount of soy consumed by Asian populations may have protective effects against some cancers such as breast cancer.[30]

2. EAT LESS RED AND PROCESSED MEAT

The Cancer Council of Australia states, "There is evidence to suggest that diets high in red meat (particularly processed meats such as salami or ham) can increase the risk of developing cancer", in particular bowel and oesophageal cancers. They recommend minimising processed meat, and advise people who eat red meat to "Eat small serves of lean meat and limit it to 3-4 times a week. Incorporate chicken and fish into other meals or try vegetarian alternatives."[31-33]

3. AVOID SALTY FOODS

Research shows that high salt diets seem to increase the risk of stomach cancer, which is currently the fourth most common cause of death from cancer in Australia.[34,35]

In the WCRF Expert Report, one of its eight key recommendations for preventing cancer advised a limited consumption of salt. The report specifically targeted salty and salt-preserved foods, but also turned its attention to less obvious dietary salt. The report recommended people limit their consumption of processed foods with added salt to ensure an intake of less than 6g of salt—or 2.4g of sodium—per day.[5]

4. MAINTAIN A HEALTHY WEIGHT

The WCRF found that maintaining a healthy weight throughout life may be one of the most important ways to protect against cancer.[5]

According to the Cancer Council of Australia, "Being overweight or obese increases your risk of developing certain types of cancer, including bowel and (post-menopausal) breast cancer, as well as cancers of the endometrium, kidney and oesophagus. Three per cent of cancer deaths are attributed to having a body mass index (BMI) over 25kg/m^2."[36] Excess fat around the stomach, and obesity, are well-documented risk factors for these cancers.[37] "Reducing weight by even 5-10% for overweight/obese individuals greatly decreases the chances of developing cancer."[38] The WCRF found that consumption of sugary drinks and energy-dense foods (such as high fat foods) is increasing world-wide and probably contributing to the global increase in obesity.[5] They recommended limiting or totally avoiding these foods.

✔ MOVE MORE

Studies have found that being physically active helps to protect against cancer, even if you are overweight. If exercise helps you lose weight, that gives an additional advantage.

According to the Cancer Council of Australia, "Doing little or no physical activity is associated with a higher risk of developing certain types of cancer. Physical inactivity is responsible for 14% of colon cancers and 11% of post-menopausal breast cancers—and probably contributes to many other cancers. Being more active can also reduce body weight, another factor that influences the risk of developing cancer."[39-41]

The specific recommendations made by the WCRF Expert Report into cancer prevention are to:[5]

- be moderately physically active (e.g. brisk walking) for at least 30 minutes every day
- as fitness improves, increase to 60 minutes of moderate activity, or at least 30 minutes of more vigorous physical activity
- limit sedentary habits such as watching television

THE BOTTOM LINE

There are no guarantees against cancer and many factors are yet to be identified and understood. But decades of evidence, scrutinised by strict scientific standards, has clearly demonstrated the protective effects of eating a healthy diet high in plant foods, being physically active and sun-smart, and avoiding cigarettes and alcohol. By adopting these practices, we can reduce the opportunities for cancer-causing DNA damage while maximising our body's ability to prevent and repair any damage.

REFERENCES

1. Cancer Council of Australia. Facts and Figures, Cancer in Australia. 2012; http://www.cancer.org.au/about-cancer/what-is-cancer/facts-and-figures.html. Accessed October, 2012.

2. Cancer Council of Australia. What is Cancer? 2012; http://www.cancervic.org.au/about-cancer/what-is-cancer. Accessed October, 2012.

3. Anand P, Kunnumakkara AB, Sundaram C, et al. Cancer is a preventable disease that requires major lifestyle changes. *Pharm Res*. Sep 2008;25(9):2097-2116.

4. Cancer Council Australia. Preventing Cancer. 2012; http://www.cancer.org.au/preventing-cancer/. Accessed October, 2012.

5. Wiseman M. The second World Cancer Research Fund/American Institute for Cancer Research expert report. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. *Proc Nutr Soc*. Aug 2008;67(3):253-256.

6. Tonini G, D'Onofrio L, Dell'Aquila E, Pezzuto A. New molecular insights in tobacco-induced lung cancer. *Future Oncol*. May 2013;9(5):649-655.

7. Hussain SP, Amstad P, Raja K, et al. Mutability of p53 hotspot codons to benzo(a)pyrene diol epoxide (BPDE) and the frequency of p53 mutations in nontumorous human lung. *Cancer Res*. Sep 1 2001;61(17):6350-6355.

8. Beroud C, Soussi T. p53 gene mutation: software and database. *Nucleic Acids Res*. Jan 1 1998;26(1):200-204.

9. Warren GW, Cummings KM. Tobacco and lung cancer: risks, trends, and outcomes in patients with cancer. *Am Soc Clin Oncol Educ Book*. 2013;33:359-364.

10. Ferlay J, Bray F, Pisani P, Parkin D. GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide. IARC CancerBase No. 5. version 2.0. Lyon: IARCPress, 20042004.

11. Berstein LM, Santen RJ. *Innovative Endocrinology of Cancer*: Springer Science+Business Media; 2009.

12. Cancer Council NSW. How much Cancer Does Smoking Cause? 2012; http://www.cancercouncil.com.au/31903/reduce-risks/smoking-reduce-risks/tobacco-facts/how-much-cancer-does-smoking-cause/?pp=713. Accessed October, 2012.

13. Cancer Council NSW. Alcohol and Cancer: Position Statement. 2012; http://www.cancercouncil.com.au/2397/get-informed/risk-and-prevention-get-informed/alcohol/alcohol-and-cancer2/?pp=61362. Accessed October, 2012.

14. Cancer Council Australia. Alcohol. 2012; http://www.cancer.org.au/preventing-cancer/nutrition-and-physical-activity/alcohol.html. Accessed October, 2012.

15. Chen WY, Rosner B, Hankinson SE, Colditz GA, Willett WC. Moderate alcohol consumption during adult life, drinking patterns, and breast cancer risk. *JAMA*. Nov 2 2011;306(17):1884-1890.

REFERENCES (CONT.)

16. de Menezes RF, Bergmann A, Thuler LC. Alcohol consumption and risk of cancer: a systematic literature review. *Asian Pac J Cancer Prev.* 2013;14(9):4965-4972.

17. Stein JH, Keevil JG, Wiebe DA, Aeschlimann S, Folts JD. Purple grape juice improves endothelial function and reduces the susceptibility of LDL cholesterol to oxidation in patients with coronary artery disease. *Circulation.* Sep 7 1999;100(10):1050-1055.

18. Australian Bureau of Statistics. Causes of Death, Australia 2011. In: Statistics ABo, ed. Canberra: Australian Bureau of Statistics; 2013.

19. M.P. Curado, B. edwards, H.R. shin, et al. Cancer Incidence in Five Continents. In: Cancer IAfRo, ed. Vol IX. Lyons, France: International Agency for Research on Cancer; 2007.

20. Staples M, Marks R, Giles G. Trends in the incidence of non-melanocytic skin cancer (NMSC) treated in Australia 1985-1995: are primary prevention programs starting to have an effect? *Int J Cancer.* Oct 5 1998;78(2):144-148.

21. Cancer Council Australia. Skin Cancer. 2012; http://www.cancer.org.au/about-cancer/types-of-cancer/skin-cancer.html. Accessed October, 2012.

22. Diao DY, Lee TK. Sun-protective behaviors in populations at high risk for skin cancer. *Psychol Res Behav Manag.* 2013;7:9-18.

23. Howlader N, Noone AM, Krapcho M, et al. SEER Cancer Statistics Review, 1975-2010. In: Institute NC, ed. Bethesda: National Institute of Health; 2013.

24. Weinstock MA. ABCD, ABCDE, and ABCCCDEEEEFNU. *Arch Dermatol.* Apr 2006;142(4):528.

25. Rigel DS, Friedman RJ, Kopf AW, Polsky D. ABCDE--an evolving concept in the early detection of melanoma. *Arch Dermatol.* Aug 2005;141(8):1032-1034.

26. Miglio C, Chiavaro E, Visconti A, Fogliano V, Pellegrini N. Effects of different cooking methods on nutritional and physicochemical characteristics of selected vegetables. *J Agric Food Chem.* Jan 9 2008;56(1):139-147.

27. Gliszczynska-Swiglo A, Ciska E, Pawlak-Lemanska K, Chmielewski J, Borkowski T, Tyrakowska B. Changes in the content of health-promoting compounds and antioxidant activity of broccoli after domestic processing. *Food Addit Contam.* Nov 2006;23(11):1088-1098.

28. Le Leu RK, Brown IL, Hu Y, Morita T, Esterman A, Young GP. Effect of dietary resistant starch and protein on colonic fermentation and intestinal tumourigenesis in rats. *Carcinogenesis.* Feb 2007;28(2):240-245.

29. Fritz H, Seely D, Flower G, et al. Soy, red clover, and isoflavones and breast cancer: a systematic review. *PLoS One.* 2013;8(11):e81968.

30. Wu AH, Yu MC, Tseng CC, Pike MC. Epidemiology of soy exposures and breast cancer risk. *Br J Cancer.* Jan 15 2008;98(1):9-14.

31. Cancer Council Australia. Food and Nutrition. 2012; http://www.cancer.org.au/preventing-cancer/nutrition-and-physical-activity/food-and-nutrition.html. Accessed October, 2012.

32. Smolinska K, Paluszkiewicz P. Risk of colorectal cancer in relation to frequency and total amount of red meat consumption. Systematic review and meta-analysis. *Arch Med Sci.* Aug 30 2010;6(4):605-610.

33. Salehi M, Moradi-Lakeh M, Salehi MH, Nojomi M, Kolahdooz F. Meat, fish, and esophageal cancer risk: a systematic review and dose-response meta-analysis. *Nutr Rev.* May 2013;71(5):257-267.

34. Yang WG, Chen CB, Wang ZX, et al. A case-control study on the relationship between salt intake and salty taste and risk of gastric cancer. *World J Gastroenterol.* Apr 21 2011;17(15):2049-2053.

35. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer.* Dec 15 2010;127(12):2893-2917.

36. Cancer Council Australia. Body Weight. 2012; http://www.cancer.org.au/preventing-cancer/nutrition-and-physical-activity/body-weight.html. Accessed October, 2012.

37. Calle EE, Rodriguez C, Walker-Thurmond K, Thun MJ. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. *N Engl J Med.* Apr 24 2003;348(17):1625-1638.

38. Cancer Council NSW. Do Fruit and Vegetables Help Prevent Cancer. 2012; http://www.cancercouncil.com.au/1594/get-informed/risk-and-prevention-get-informed/diet-cancer/do-fruit-and-veg-prevent-cancer/?pp=1594. Accessed October, 2012.

39. Cancer Council Australia. Physical Activity. 2012; http://www.cancer.org.au/preventing-cancer/nutrition-and-physical-activity/physical-activity.html. Accessed October, 2012.

40. La Vecchia C, Braga C, Franceschi S, Dal Maso L, Negri E. Population-attributable risk for colon cancer in Italy. *Nutr Cancer.* 1999;33(2):196-200.

41. Neilson HK, Friedenreich CM, Brockton NT, Millikan RC. Physical activity and postmenopausal breast cancer: proposed biologic mechanisms and areas for future research. *Cancer Epidemiol Biomarkers Prev.* Jan 2009;18(1):11-27.

Written by Julie Hoey, Maddison Fox, Dr Darren Morton, Dr Christiana Leimena, & Dr Ross Grant.
Edited by Christina Hawkins, Lyle Southwell, Sue Robinson, Maddison Fox & Jade Guest.

Designed by Shelley Poole.
Course serviced by Adventist Media Network.
Course content provided by Sanitarium Health and Wellbeing, Australasian Research Institute and Sydney Adventist Hospital.

SYDNEY ADVENTIST HOSPITAL

Sanitarium health & wellbeing

Australasian Research Institute

JULIE HOEY

BSc (Nutrition and Food Science), Grad Dip Dietetics, Grad Dip Ed

A qualified dietitian and science teacher, Julie loves reading the latest research into the amazing human body. With her husband and six-year old daughter, she lives on 100 acres of bush in New South Wales, and works at Avondale College of Higher Education.

MADDISON FOX

BSc (Nutrition), Hons (Dietetics), APD, AN, BAppSc (Exercise and Sport Science), Sports Dietitian

Maddison is passionate about healthy food and its interaction with the health of body, mind, heart and spirit. She utilises the latest nutritional science to teach others how to create healthy food, reduce obesity and the risk of disease and chronic conditions.

DR ROSS GRANT

PhD (NeuroPharmacology), MAppSc (Clin Chemistry) BEd (Sc) (Biochemistry/Chemistry)

Dr Grant is a Biochemical Pharmacologist in the School of Medical Sciences University of New South Wales, Clinical Associate Professor at the University of Sydney Medical School and Head of the Australasian Research Institute at Sydney Adventist Hospital.

DR DARREN MORTON

PhD (Human Physiology), MAppSc (Human Movement), BEd (Distinction), Senior Lecturer at Avondale College of Higher Education

Darren is passionate about empowering others to live more. He has delivered hundreds of presentations on lifestyle related topics all over the world, written numerous publications and is a key presenter on the Complete Health Improvement Program (CHIP). He enjoys family time, triathlon and hang gliding.

DR CHRISTIANA LEIMENA

PhD (Cell Biology and Inherited Heart Disease), BSc Hons (Biomedical Science)

As a medical science researcher, Christiana has worked in the field of inherited heart disease for over a decade, and continues to research the latest in medical health. Christiana loves to be active in the outdoors and is passionate in sharing with others on how to live a healthy, abundant life, both physically and spiritually.

1 **LIVING WELL**
WELCOME TO THE START OF GREAT HEALTH

2 **GOOD EATING**
ESSENTIALS OF CHOOSING HEALTHY FOOD

3 **A HEALTHY HEART?**
UNDERSTANDING CARDIOVASCULAR DISEASE

4 **SUGAR ISSUES**
PREVENTING & REVERSING DIABETES

GREAT HEALTH • 5 • Hope Channel Course

THE SILENT KILLER
WHAT WE DO KNOW ABOUT CANCER

6 **PLANTS & FATS**
EXPLORING PLANT-BASED DIETS

7 **STAYING IN CONTROL**
HOW TO MAINTAIN A HEALTHY WEIGHT

8 **MOVING WELL**
HOW TO MOVE SMART

9 **LESS IS MORE**
ALL ABOUT ALCOHOL & CAFFEINE

10 **WATER & SLEEP**
WHY HYDRATION & REST ARE UNDERRATED

11 **SUNSHINE & BUGS**
SUNLIGHT & INTESTINAL BACTERIA

12 **FEELING GOOD**
KEYS TO EMOTIONAL HEALTH

13 **LIVING IN FREEDOM**
CARING FOR YOUR SPIRITUAL WELLBEING