

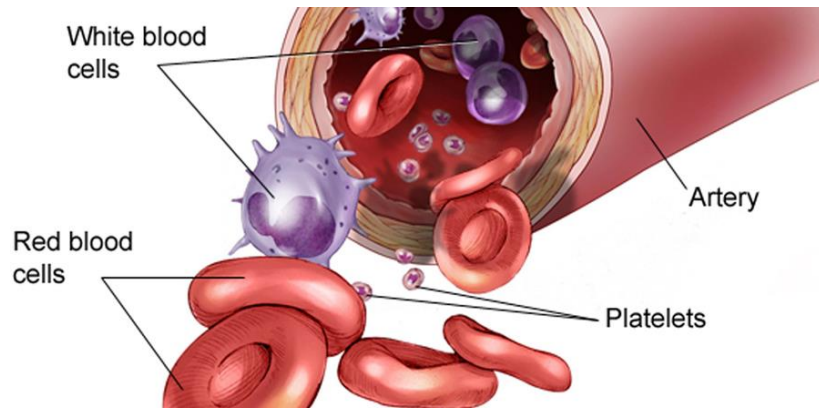
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University of Sydney

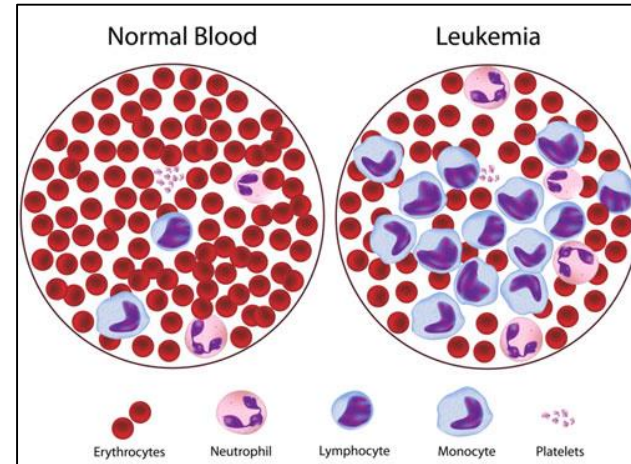
What I do

- Research Associate, University of Sydney and Centre for Cancer Research Westmead
- Stem Cell Transplant/ Leukemia Cell Therapy
- Preclinical protocol development for cell therapy options to combat infections in stem cell transplant patients
- Clinical trials running at Westmead and other Blood and Marrow Transplant Centers nationally

Blood Cancers

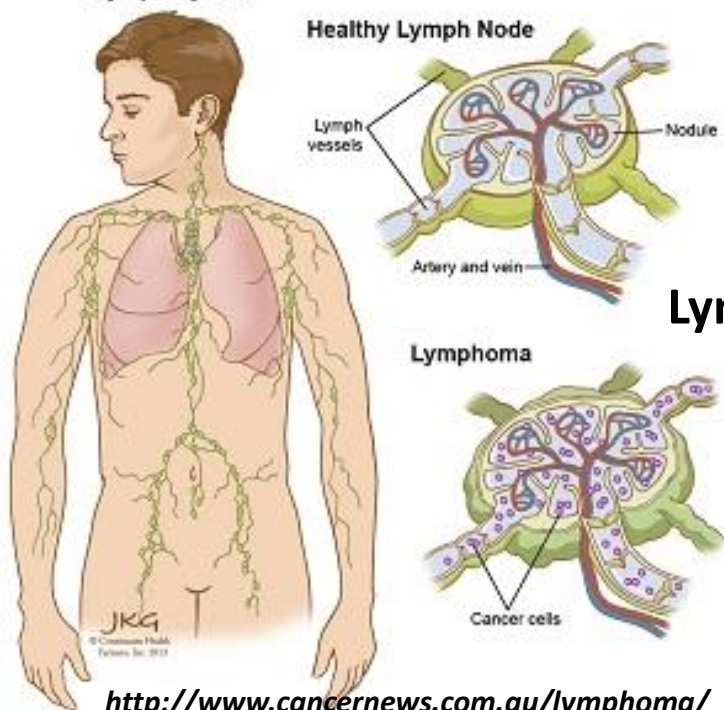


Leukemia



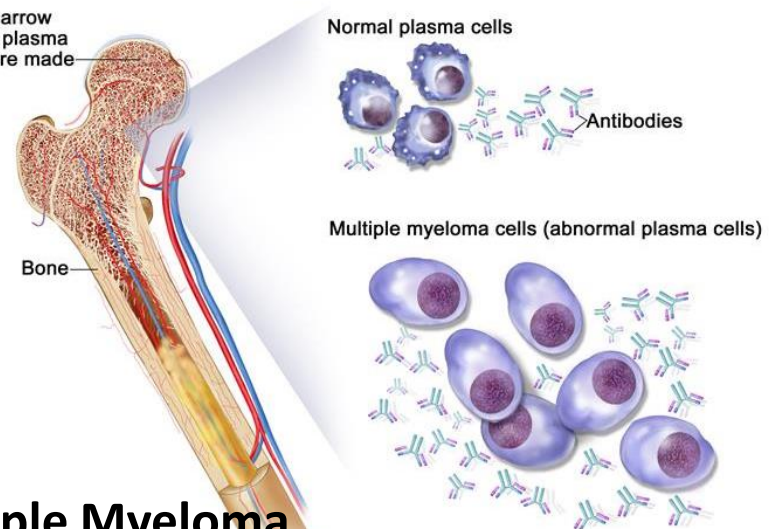
Indo American News on February 7, 2013

Lymph System



Lymphoma

Red marrow where plasma cells are made

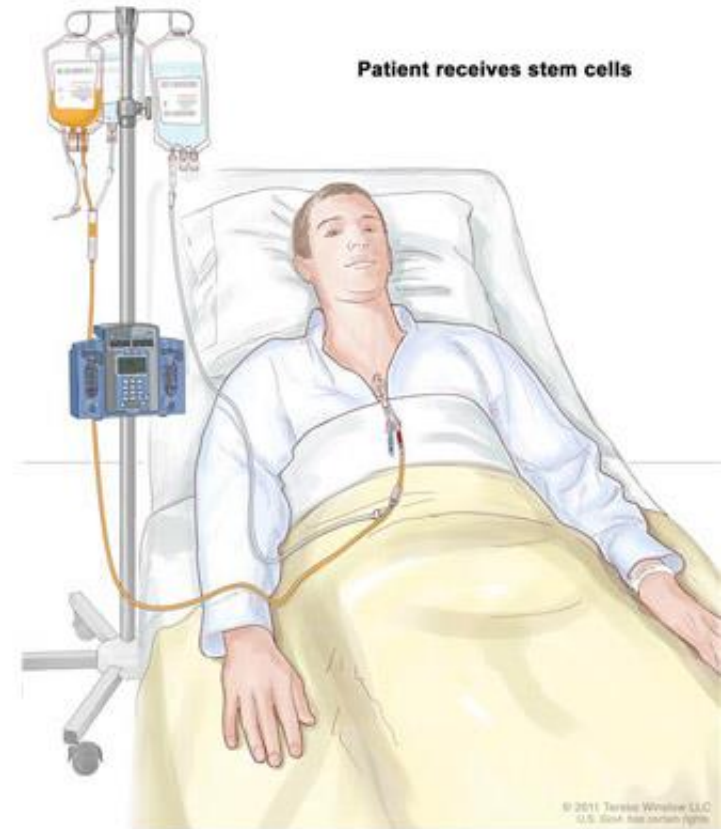
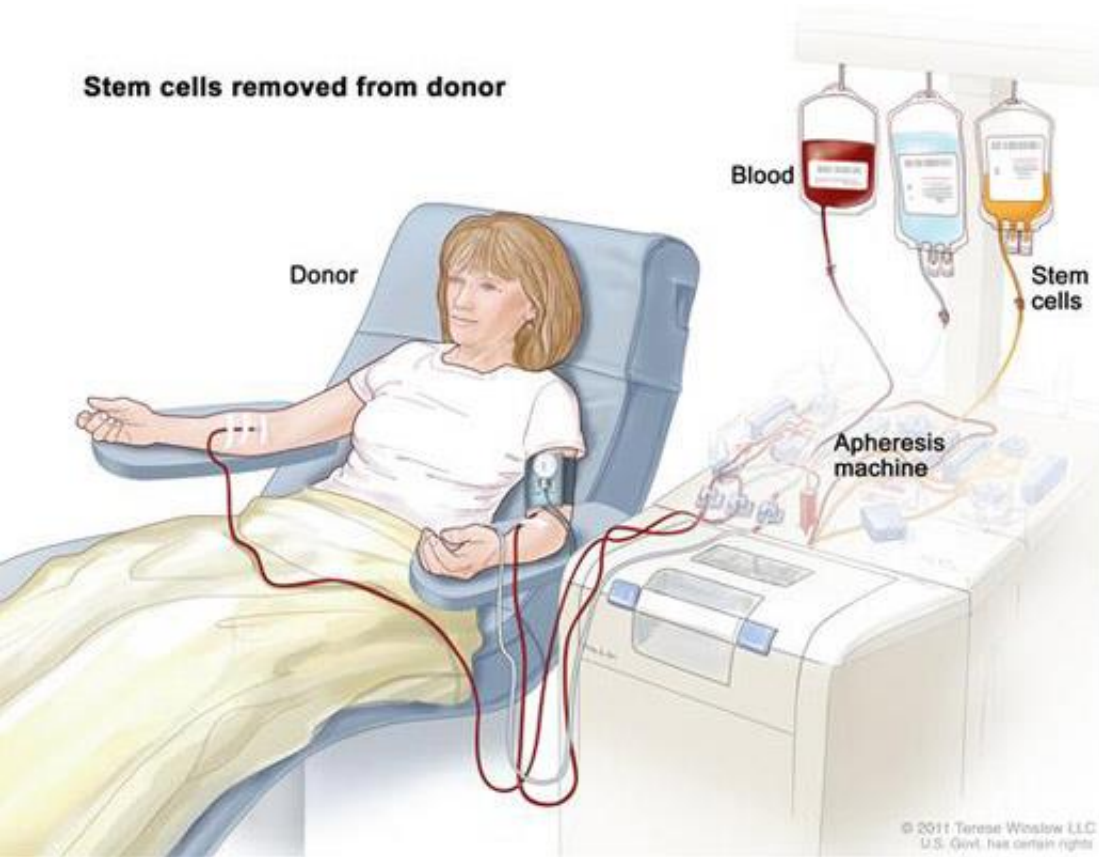


Multiple Myeloma

MEDPAGE Today June 15, 2012

<http://www.cancernews.com.au/lymphoma/>

Stem Cell Transplant



ALLOGENEIC- cells from related or unrelated donor given to patient

AUTOLOGOUS- patients own cells harvested prior to therapy given back

What is a Stem Cell?

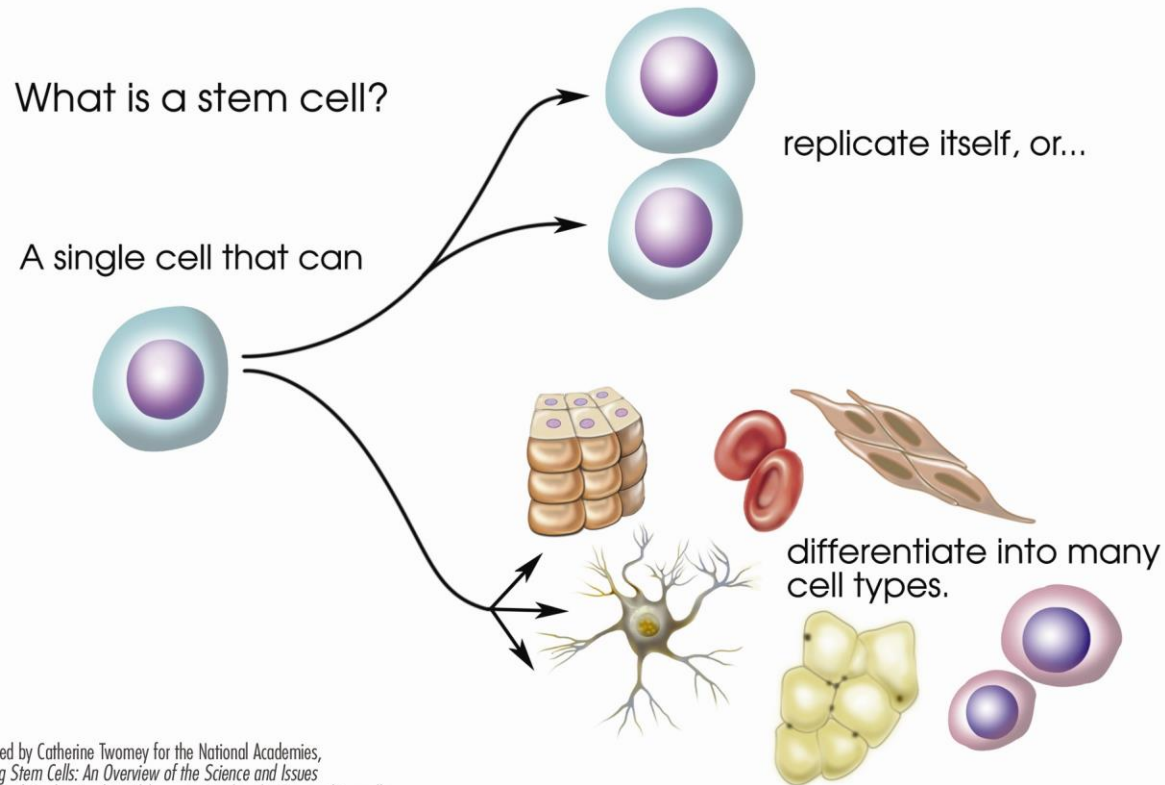


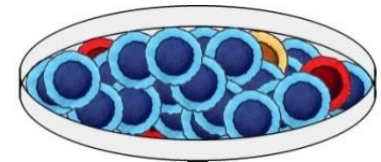
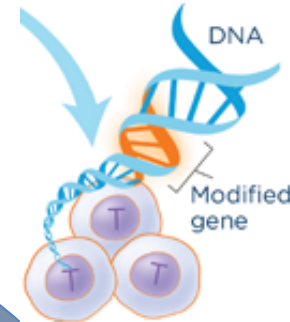
Image prepared by Catherine Twomey for the National Academies, *Understanding Stem Cells: An Overview of the Science and Issues* from the National Academies, <http://www.nationalacademies.org/stemcells>. Academic noncommercial use is permitted.

Stem Cell Transplant

- Most successful form of treatment for many blood cancers if a suitable donor can be found
- Patients' diseased blood cells are destroyed (by chemotherapy and total body irradiation) and replaced with a brand new (healthy) blood system
- Leads to severe immune suppression, thus making patient highly susceptible to severe infections
- Infections are the highest cause of non-relapse deaths in these patients within first year of transplant
- Adoptive T cell therapy (adopting a new immune system)
 - Virus infections
 - Fungal infections
- Adoptive T cell therapy trials started at Westmead in 2005
 - Now multi-centre clinical studies

Adoptive T-cell Therapy

DONOR
(sibling, parent,
unrelated matched
donor)

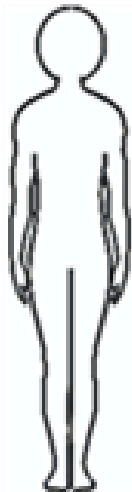


**IMMUNITY
TRANSPLANT**

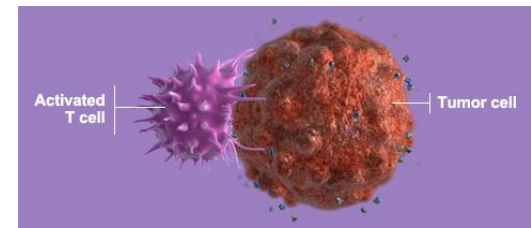
Stem Cell Transplant



PATIENT



Now also anti-tumour immunotherapy



REVIEW

Adoptive T-cell therapy for fungal infections in haematology patients

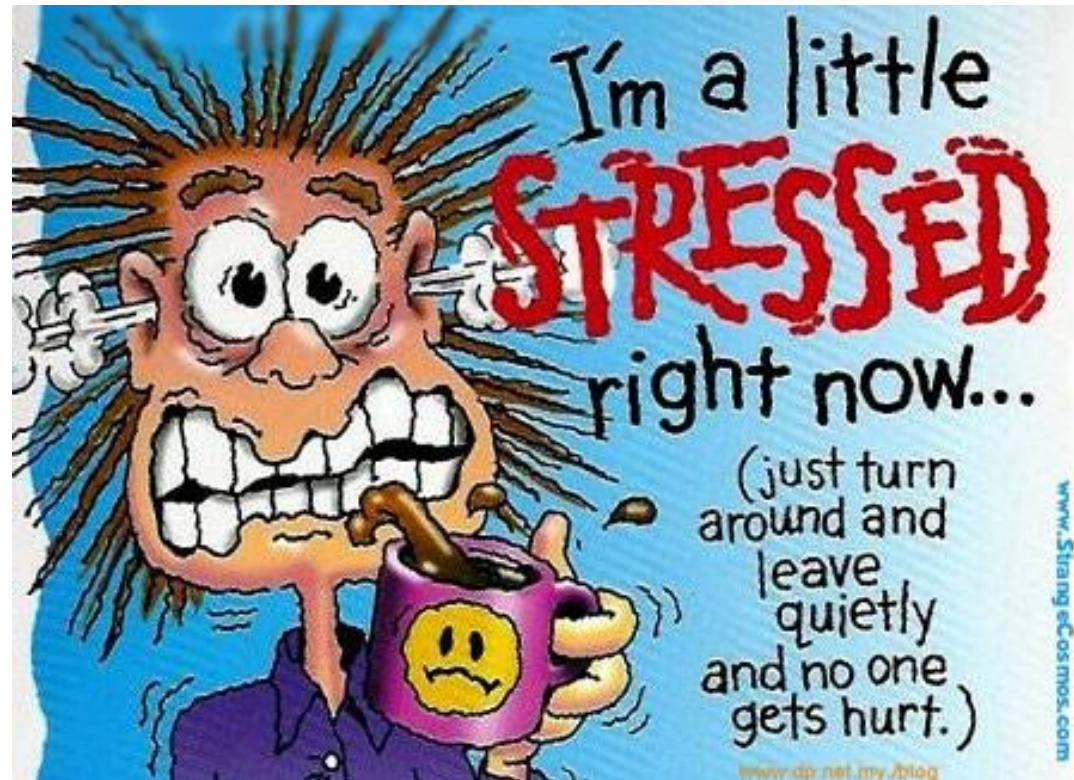
Shivashni S Deo^{1,2} and David J Gottlieb^{1,2,3,4}

The prolonged immune deficiency resulting from haematopoietic stem cell transplant and chemotherapy predisposes to a high risk of invasive fungal infections. Despite the recent advances in molecular diagnostic testing, early initiation of pre-emptive antifungal therapy and the use of combination pharmacotherapy, mortality from invasive mould infections remain high among recipients of allogeneic stem cell transplant. The increasing incidences of previously rare and drug-resistant strains of fungi present a further clinical challenge. Therefore, there is a need for novel strategies to combat fungal infections in the immunocompromised. Adoptive therapy using *in vitro*-expanded fungus-specific CD4 cells of the Th-1 type has shown clinical efficacy in murine studies and in a small human clinical study. Several techniques for the isolation and expansion of fungus-specific T cells have been successfully applied. Here we discuss the incidence and changing patterns of invasive fungal diseases, clinical evidence supporting the role of T cells in fungal immunity, methods to expand fungus-specific T cells in the laboratory and considerations surrounding the use of T cells for fungal immunotherapy.

Clinical & Translational Immunology (2015) 4, e40; doi:10.1038/cti.2015.16; published online 14 August 2015

My life

STUDY, EXAMS & DEADLINES = STRESS & PANIC
ATTACKS!!!



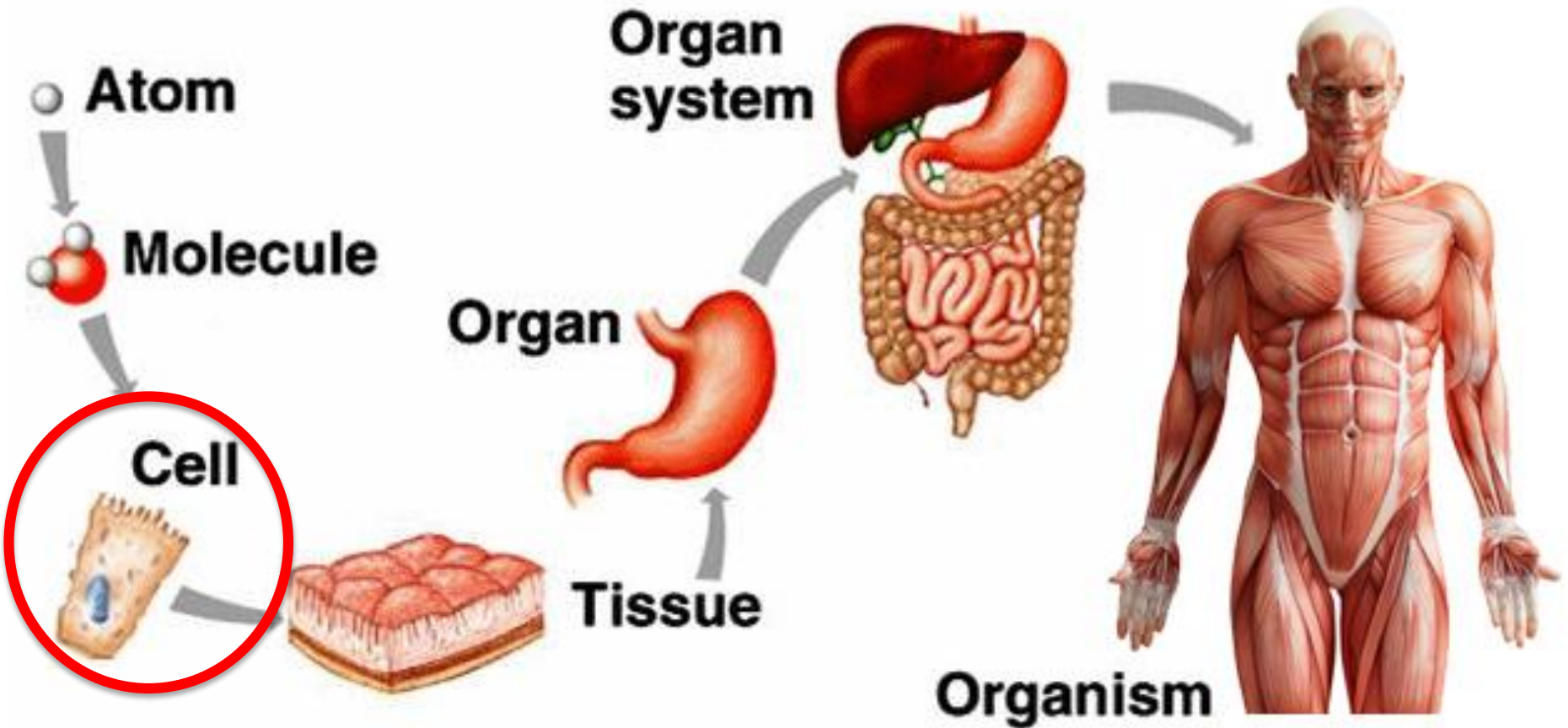
What yoga has done for me

- Curious about yoga for fitness
- Saw advert on public noticeboard at Westmead Hospt
- Joined in 2007 (midway through PhD).... never looked back!
- Improved physical fitness
 - Strength and flexibility
- Emotional strength
 - Positive attitude
 - More accepting of situations
- Stress management/ better coping skills
- Improved focus/ concentration
- Healthier lifestyle
- Lower back disc problem

YOGA and CANCER

CANCER

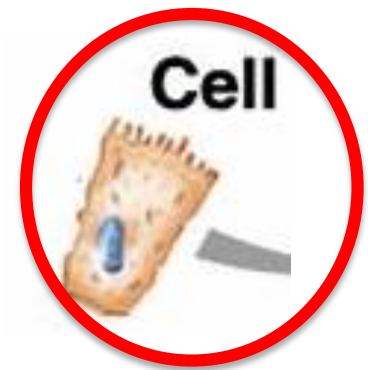
The Body



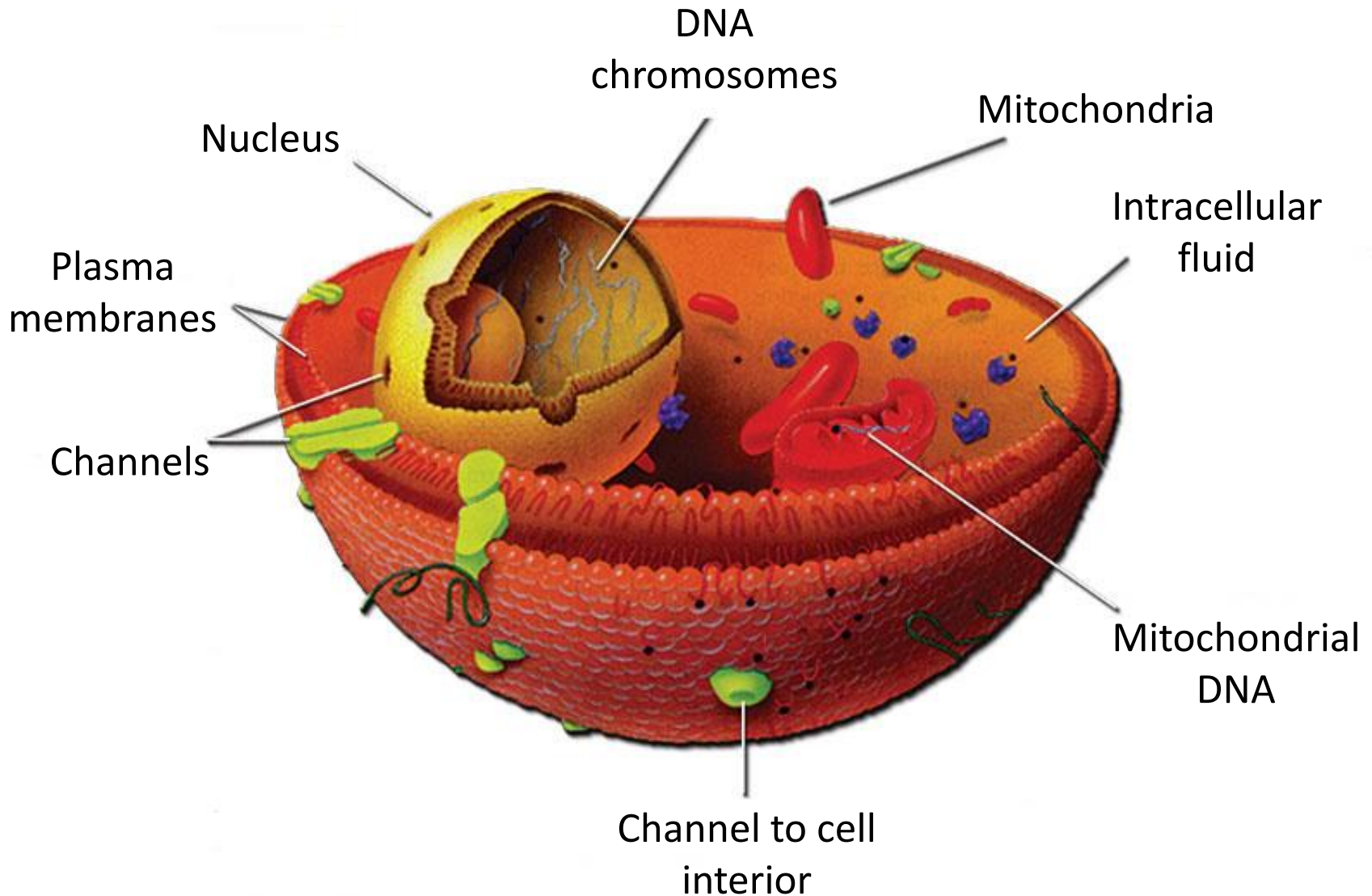
What is a Cell?

The Cell

- The basic structural, functional and biological unit of all known living organisms
- The smallest unit of life that can replicate independently
- The building block of life



The Cell



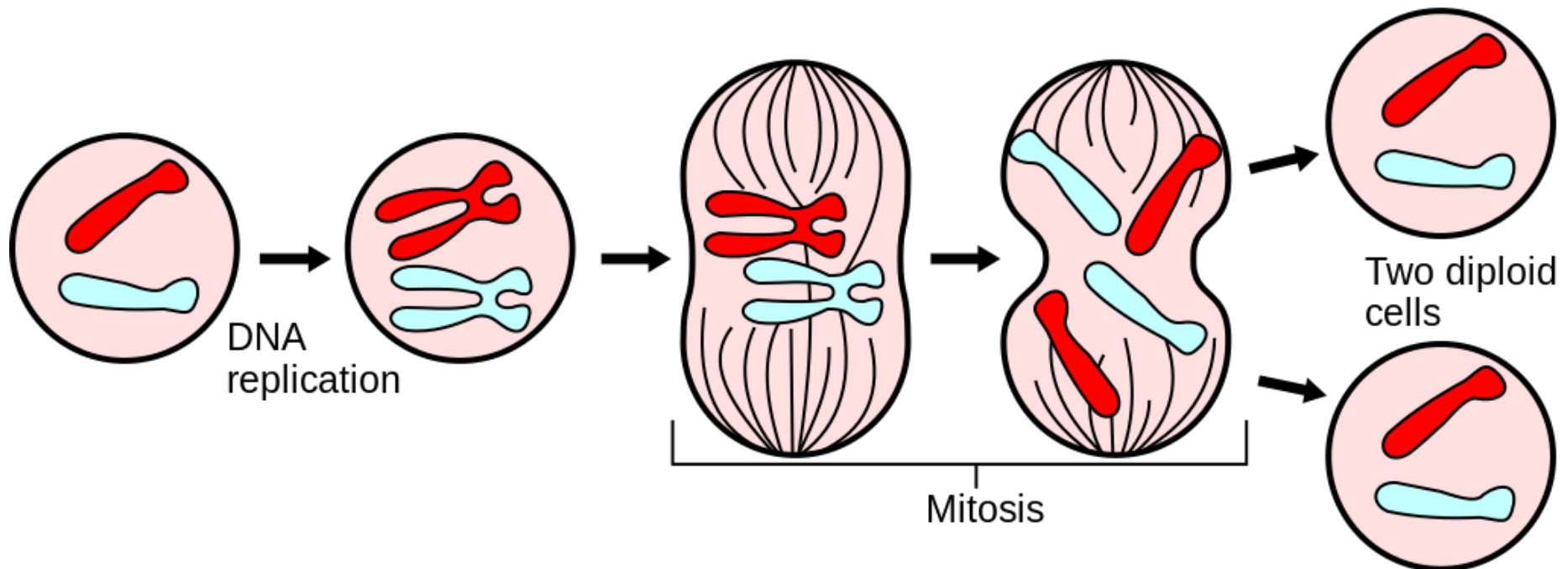
Adapted from: <http://pristinenutraceuticals.com/human-cell/>

Cell Division

The process of making new body cells

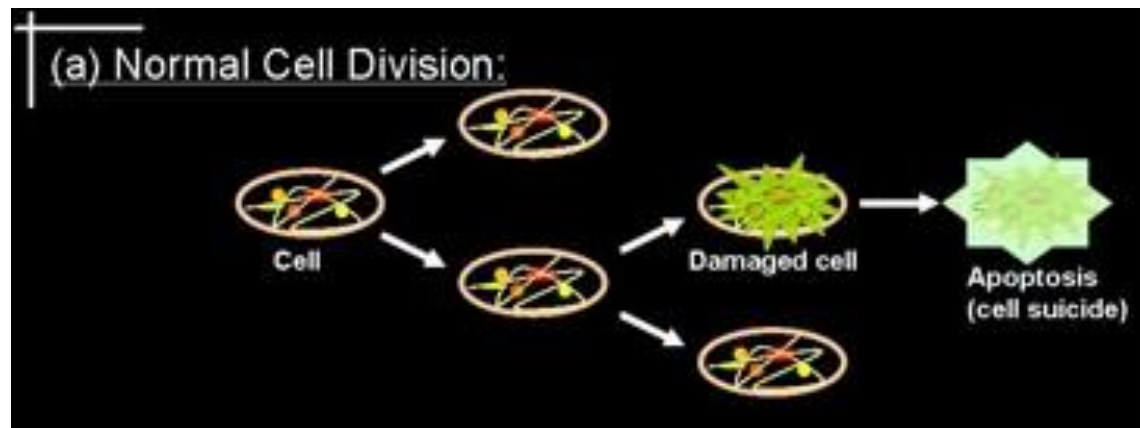
Continuous process in the body- all cells have limited lifespan and are continuously replaced by new cells

A cell duplicates all of its contents, including its DNA and splits to form 2 identical daughter cells



Cell Division

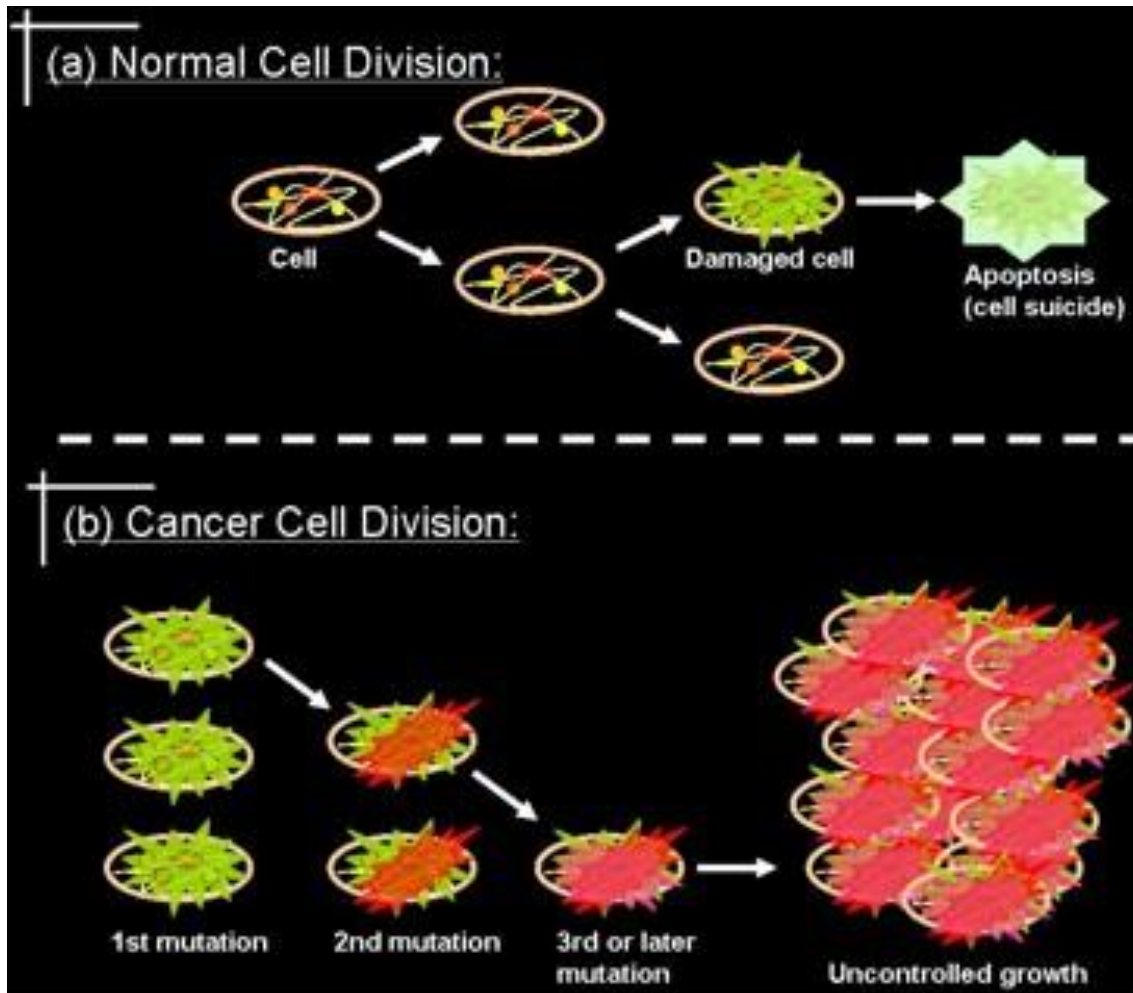
- Tightly regulated/controlled process
- Some cells get damaged and are eliminated by the process of apoptosis (programmed cell death)
- The integrity of the genome must be maintained



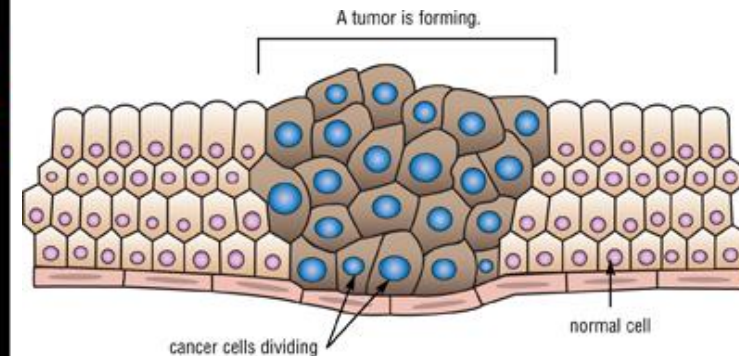
What is Cancer?

Cancer

Cancer is **UNCONTROLLED CELL GROWTH**



Something causes a mistake in the cells DNA, leading to loss of control of cell growth

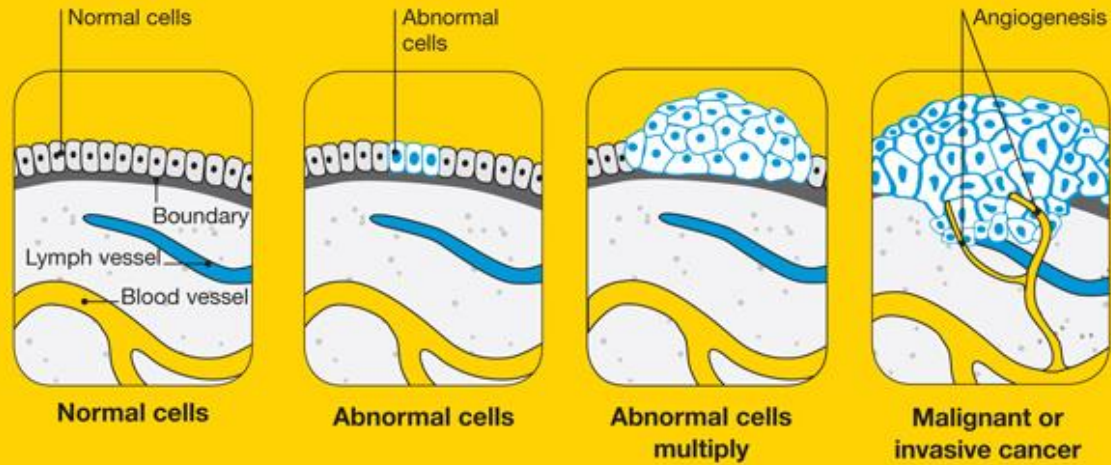


<http://www.gettingtoknowcancer.org/overview.php>

php

Cancer Diagram

How cancer starts



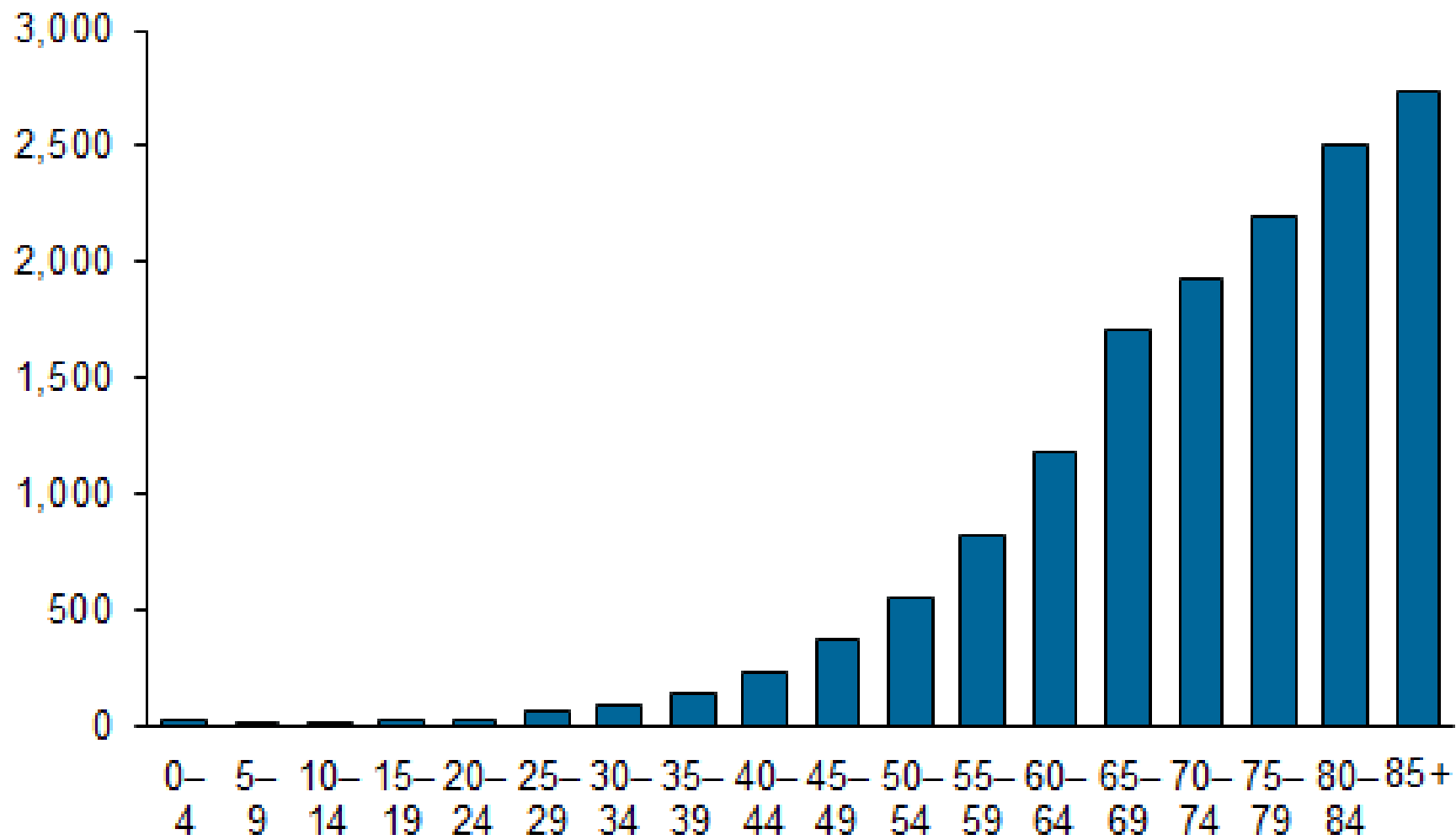
How cancer spreads



Cancer statistics in Australia

- 128,000 new cases of cancer will be diagnosed in Australia this year, this will rise to 150,000 by 2020
- 1 in 2 Australian men and 1 in 3 Australian women will be diagnosed with cancer before the age of 85
- Leading cause of death in Australia
- Costs >\$4.5 billion in direct health costs
- ~20% of all health research expenditure is on cancer
- Death rate has fallen by 16% over past 30 years
- 66% of people diagnosed with cancer are alive after 5 years

Number of new cases per 100,000 people



Top 5 Cancers in Australia

- Prostate
- Colorectal (Bowel)
- Breast
- Melanoma
- Lung cancer

These account for 60% of all cancers diagnosed

THE MOST COMMON CANCERS IN AUSTRALIA



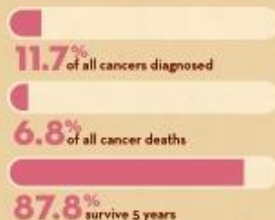
3

BREAST

12,670

DIAGNOSED IN A YEAR

Breast cancer is Australia's 3rd most common cancer and is more common in women.



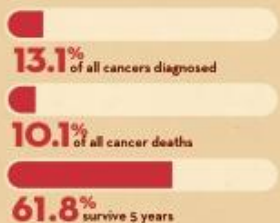
2

BOWEL

14,234

DIAGNOSED IN A YEAR

Bowel cancer is Australia's 2nd most common cancer and is common in both men and women.



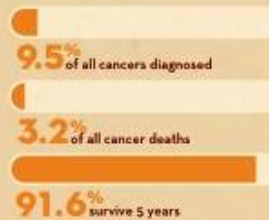
4

MELANOMA

10,342

DIAGNOSED IN A YEAR

Melanoma is Australia's 4th most common, and affects males and females of all ages.



5



LUNG

9,703

DIAGNOSED IN A YEAR

Lung cancer is Australia's 5th most common cancer. It occurs more often in males. It is a very aggressive disease if not caught early. By the time there are symptoms it has usually spread and is not curable.



1

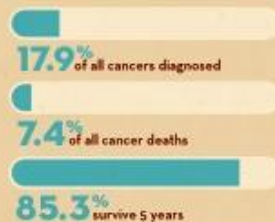


PROSTATE

19,403

DIAGNOSED IN A YEAR

Prostate cancer is Australia's most common cancer.



Prevent cancer with these lifestyle changes:

- ✓ Quit smoking
- ✓ Protect your skin from the sun
- ✓ Maintain a healthy weight & diet
- ✓ Exercise regularly
- ✓ Reduce your alcohol intake
- ✓ Avoid solariums

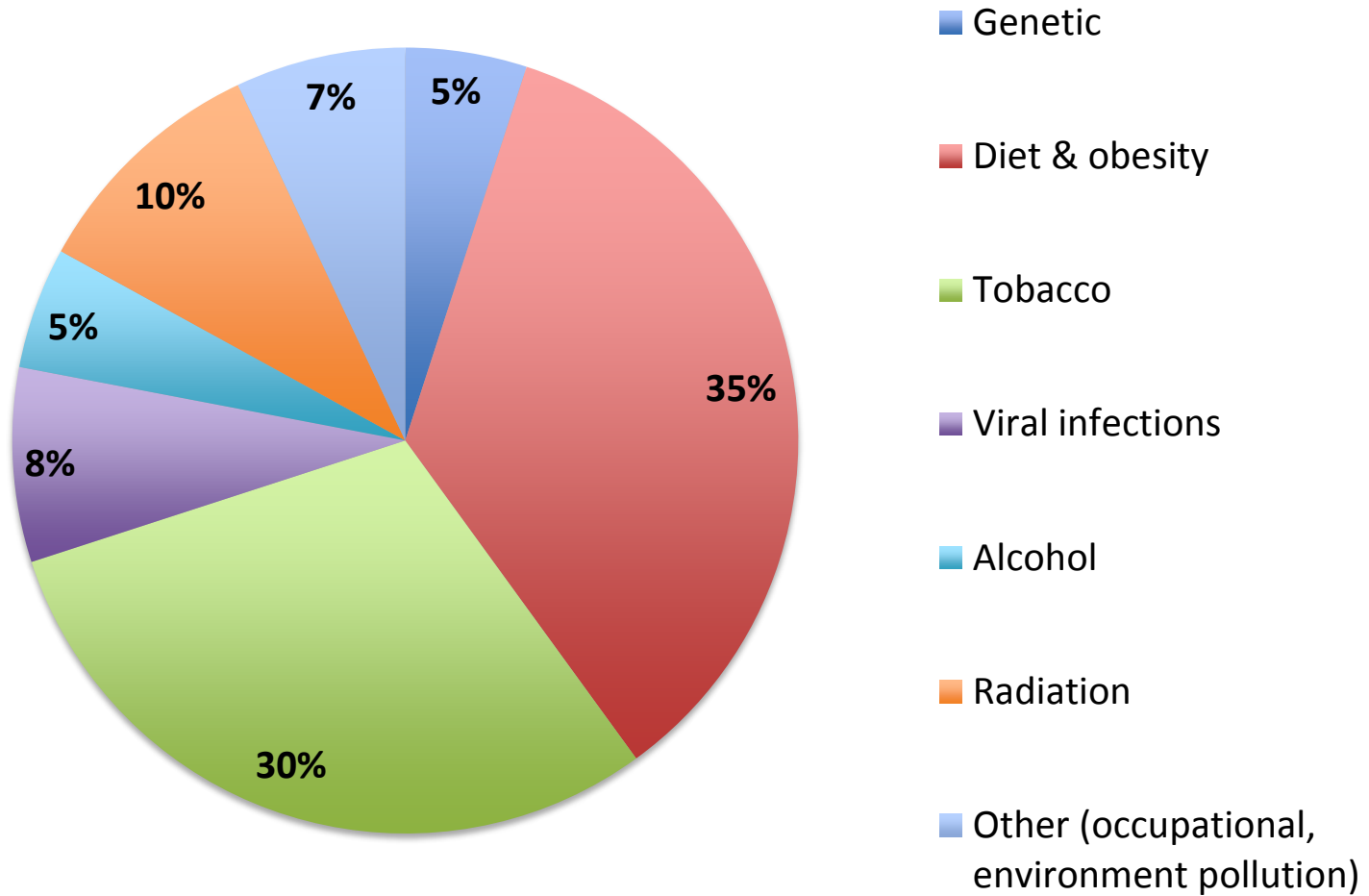
Over 100,000 Australians are diagnosed with cancer every year.

Ask your GP about age appropriate screening for:

- Cervical
- Prostate
- Breast
- Bowel

What causes Cancer?

Causes of Cancer



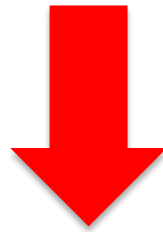
Cancer Fact

1 in 2 men

&

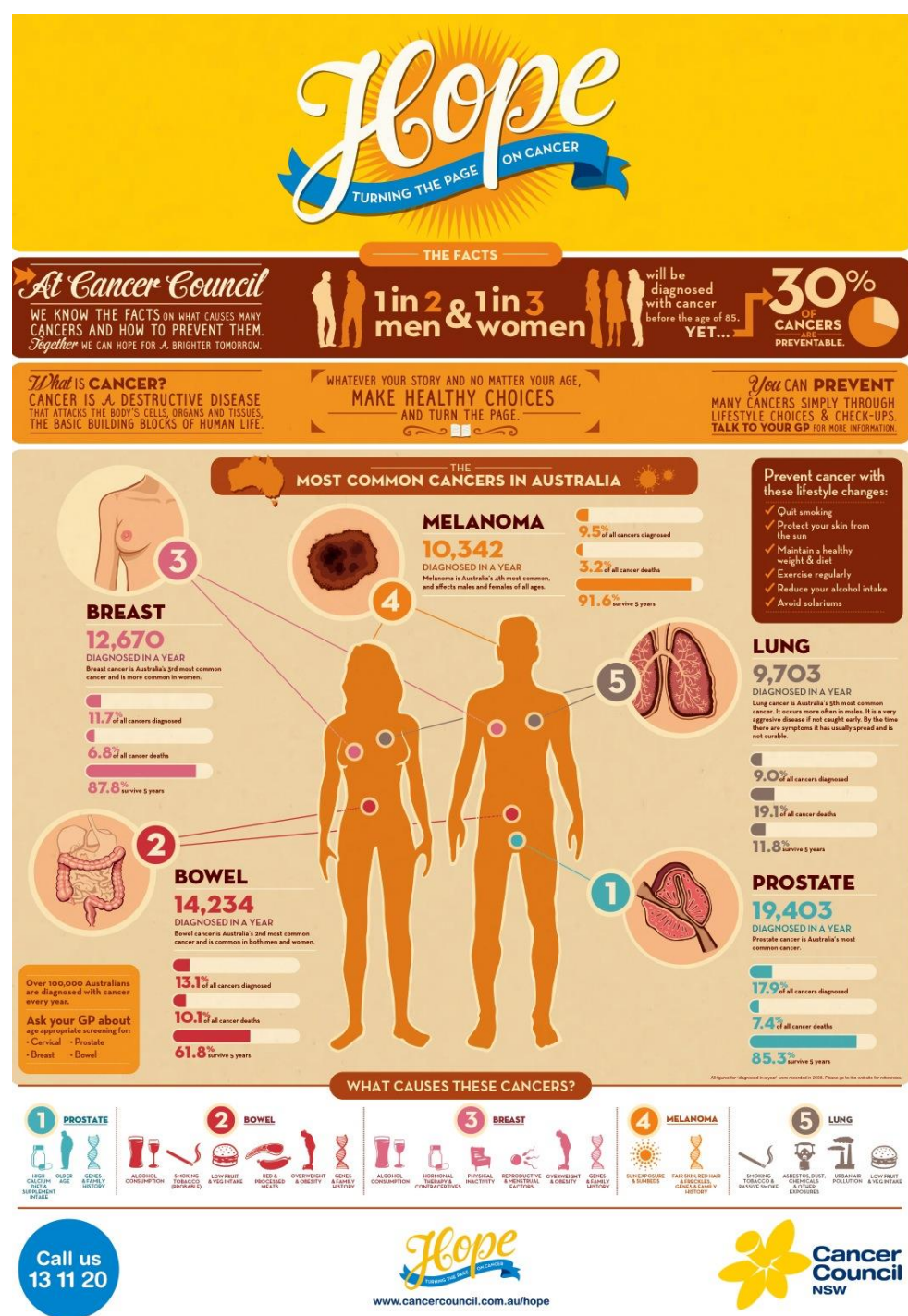
1 in 3 women

will be diagnosed with cancer before the age of 85



30% OF CANCERS ARE PREVENTABLE

Cancer Council NSW Poster



YOGA and CANCER?

Scientific Research on “Yoga and Cancer”

NCBI Resources ▾ How To ▾ Sign in to NCBI

PubMed.gov
US National Library of Medicine
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- ☐ [Pooled Analysis of Six Pharmacologic and Nonpharmacologic Interventions for Vasomotor Symptoms.](#)

Guthrie KA, LaCroix AZ, Ensrud KE, Joffe H, Newton KM, Reed SD, Caan B, Carpenter JS, Cohen LS, Freeman EW, Larson JC, Manson JE, Rexrode K, Skaar TC, Sternfeld B, Anderson GL.

Obstet Gynecol. 2015 Aug;126(2):413-22. doi: 10.1097/AOG.0000000000000927.

PMID: 26241433

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- ☐ [A randomized controlled bicenter trial of yoga for patients with colorectal cancer.](#)

Cramer H, Pokhrel B, Fester C, Meier B, Gass F, Lauche R, Eggleston B, Walz M, Michalsen A, Kunz R, Dobos G, Langhorst J.

Psychooncology. 2015 Jul 29. doi: 10.1002/pon.3927. [Epub ahead of print]

PMID: 26228466

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- ☐ [Yoga in adult cancer: an exploratory, qualitative analysis of the patient experience.](#)

McCall M, Thorne S, Ward A, Heneghan C.

BMC Complement Altern Med. 2015 Jul 22;15:245. doi: 10.1186/s12906-015-0738-9.

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Kelley GA, Kelley KS.

PLoS One. 2015 Jun 8;10(6):e0129181. doi: 10.1371/journal.pone.0129181. eCollection 2015.

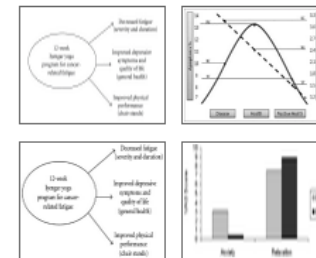
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Try the new Display Settings option - Sort by Relevance

PMC Images search for yoga and cancer



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Yoga management of breast cancer-re [BMC Complement Altern Med. 2014]

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Yoga in adult cancer: an exploratory, q [BMC Complement Altern Med. 2015]

Yoga for Health-Related Quality of Life in [Evid Based Complement Alternat...]

Meditative Movement Therapies and

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publications
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Ann N Y Acad Sci. 2000;917:68-83. Review.
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CA Cancer J Clin. 1999 Nov-Dec;49(6):362-75. Review.
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☐ [Mind-body therapy in the management and prevention of coronary disease.](#)

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264. Coker KH.
Semin Urol Oncol. 1999 May;17(2):111-8. Review.
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265. Michailov MC, Neu E, Molnar S, Schumitz A, Jaud W.
Gynakol Geburtshilfliche Rundsch. 1993;33 Suppl 1:210-1. German. No abstract available.
PMID: 8118273
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266. Schwidurski-Maib G, Jochheim KA.
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267. Joseph CD.
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☐ [The faith that heals.](#)

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First publication on
yoga and cancer in
1975



Rehabilitation (Stuttg). 1987 May;26(2):75-6.

[Current status of after-care cures in oncologic patients].

[Article in German]

Schwidurski-Maib G, Jochheim KA.

Abstract

Some 40 accredited aftercare clinics are available for inpatient cancer aftercare, since 1981 also for immediately post-acute treatment courses. These clinics are used for both, the frequent physical treatment aftermath from oncological diseases in the otological or gynaecological field, and for psychic stabilization when psychosocial problems arise. Participation in autogeneous relaxation training, yoga, and/or psychotherapeutic services are found to entail improved disease coping. Concrete patient care expectancies primarily center around movement therapy, lymphatic drainage (in breast carcinoma), speech therapy (in laryngectomees), pain control, but are also directed at psychosocial care in terms of achieving "inner calmness and relaxation". Given the age distribution seen, increasing the quality of life takes priority over restoration of the working capacity.

PMID: 3039618 [PubMed - indexed for MEDLINE]



Semin Urol Oncol. 1999 May;17(2):111-8.

Meditation and prostate cancer: integrating a mind/body intervention with traditional therapies.

Coker KH¹.

Author information

Abstract

There is growing attention to the health benefits of mind/body interventions, particularly relaxation and meditation. Biomedical research has provided undeniable evidence of the interconnectedness of the mind and body. The field of psychoneuroimmunology has defined the role of stress in reducing effectiveness of the immune system in combating infection and growth of malignant tumors. This article explains the development of meditation practice and explores the indications that the practice of meditation is effective reducing the harmful effects of stress. In addition, there are encouraging reports of studies citing the influence of melatonin on breast and prostate tumors. A preliminary study finds an association between meditation practice and levels of melatonin produced by the pineal gland.

PMID: 10332925 [PubMed - indexed for MEDLINE]

4 ways cancer patients can benefit from yoga

1. Yoga helps manage depression, fear and anxiety
 - Breathing exercises regulate nerves that deeply calm body and mind
2. The mood-boost effect
 - Exercise helps body release “happy” hormone
3. Help to manage physical pain
 - Improve circulation, relax muscle tension, remove toxic chemicals
4. Yoga community can provide support
 - Meet and talk with others who understand what patient is going through

 **SEARCH**

HOME

NEWS

BREAST SCREENING

CLINICAL CARE

ABOUT BREAST
CANCER

PATIENT SUPPORT

ONLINE SUPPORT
GROUPS

FIND A SPECIALIST

BCI SUPPORT SERVICES

MY STORY

OTHER ORGANISATIONS

VENUS NEWSLETTER

GOVERNMENT
ASSISTANCE

FUNDRAISING

RESEARCH

MEDICAL AND HEALTH
CARE PROFESSIONALS



BREASTSCREEN NSW,
SYDNEY WEST FREE
MAMMOGRAM
LOCATIONS

HOME >> PATIENT SUPPORT >> LIFE ENHANCING HATHA YOGA-RESTORATION PROGRAM

Life Enhancing Hatha Yoga-Restoration Program

Return to Health- Beyond Cancer Treatment

Effective *complementary health care* for all levels of fitness and abilities.

Yoga classes include a system of movements, breathing techniques, guided relaxation, concentration, and meditation.

Improve confidence, reduce stress, better sleep, cultivate a positive attitude and be at peace. Enjoy renewed capabilities as you strengthen balance and refresh the body, the mind and emotions with emphasis upon wellness.

An opportunity for inspiration and self development in a supportive group atmosphere. Add Yoga to your list of positive outcomes.

All equipment is provided.

General Classes

Tuesdays 6:00pm–7:30pm

Thursdays 11:00am–12:30pm

Class Location

The Seminar Rooms 2 and 4,
Education Block, Level 2, Westmead Hospital.

Movements are guided for all levels of ability.

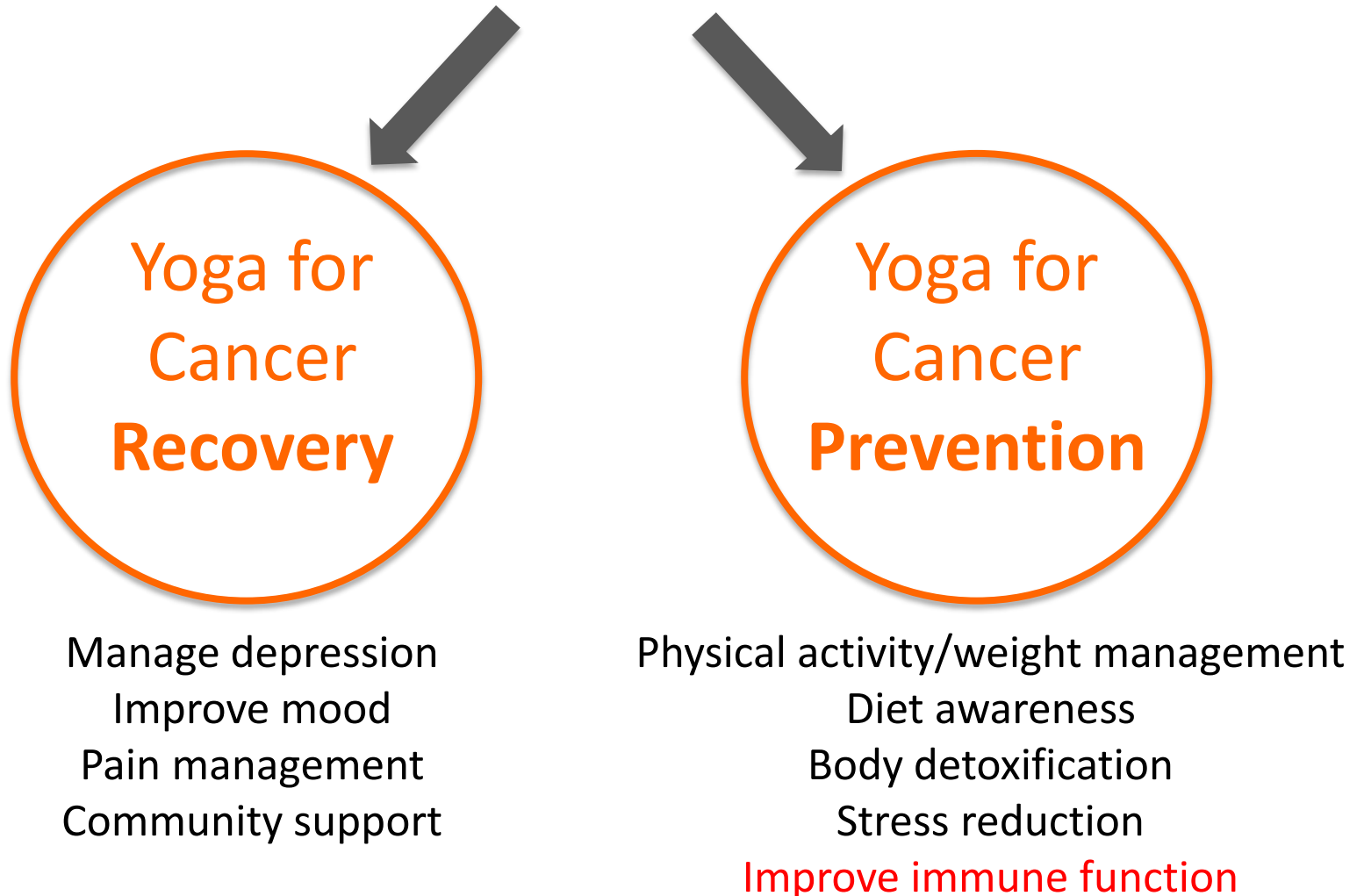
- > Please arrive 10 minutes before class commencement
- > For bookings please call 9845 9682
- > The first class is free. After that, the classes are \$10 per week, or \$90 for 10 weeks (ie a \$10 discount on blocks of 10 classes)
- > Please pay the Westmead Hospital cashier (near the main entrance) before the second class

For further information, or to let us know you are coming, please call **9845 9682**.

Yoga in Cancer Prevention

- Currently no published article in NLM
- Yoga endorsed by
 - National Foundation of Cancer Research, US
 - Cancer Research, UK
 - MD Anderson Cancer Centre, US
- Yoga for general health and wellbeing

YOGA AND CANCER



Regular Yoga Practice Improves Antioxidant Status, Immune Function, and Stress Hormone Releases in Young Healthy People: A Randomized, Double-Blind, Controlled Pilot Study.

Lim SA¹, Cheong KJ¹.

Author information

[Open/close author information list](#)

Abstract

OBJECTIVE: The aim of the present study is to highlight the beneficial effects of yoga practice on bio-parameters, such as oxidative stress, antioxidant components, immune functions, and secretion of stress hormones, in healthy young people.

STUDY DESIGN: This study was conducted on healthy volunteers recruited from among university students, who were divided into two groups: a control (no yoga intervention, n=13) group and a yoga (n=12) group. Yoga practice was with an instructor for 90 minutes once a week spread over 12 weeks, with recommendations to practice daily at home for 40 minutes with the help of a DVD. The yoga program consisted of yoga body poses (asanas), exercises involving awareness, voluntary regulation of breath (pranayama), and meditational practices. Whole blood samples were collected when the volunteers had fasted for 8 hours at 0 and 12 weeks. The oxidative stress/antioxidant components, immune-related cytokines, and stress hormones were evaluated in serum or plasma.

RESULTS: Serum levels of nitric oxide, F₂-isoprostane, and lipid peroxide were significantly decreased by yoga practice ($p<0.05$ or $p=0.01$), whereas serum total glutathione (GSH) contents, activities of GSH-peroxidase, and GSH-s-transferase were remarkably increased after yoga practice compared with the control group ($p<0.05$ or $p=0.01$). Yoga practice also significantly increased immune-related cytokines, such as interleukin-12, and interferon- γ , in serum ($p<0.05$ or $p=0.01$). Yoga practice significantly reduced the plasma levels of adrenalin ($p<0.05$) and increased plasma levels of serotonin compared with the control group ($p<0.05$).

CONCLUSIONS: Regular yoga practice remarkably attenuated oxidative stress and improved antioxidant levels of the body. Moreover, yoga beneficially affected stress hormone releases as well as partially improved immune function.

Health Impacts of Yoga and Pranayama: A State-of-the-Art Review.

Sengupta P¹.

Author information

Abstract

Thousands of years ago yoga originated in India, and in present day and age, an alarming awareness was observed in health and natural remedies among people by yoga and pranayama which has been proven an effective method for improving health in addition to prevention and management of diseases. With increasing scientific research in yoga, its therapeutic aspects are also being explored. Yoga is reported to reduce stress and anxiety, improves autonomic functions by triggering neurohormonal mechanisms by the suppression of sympathetic activity, and even, now-a-days, several reports suggested yoga is beneficial for physical health of cancer patients. Such global recognition of yoga also testifies to India's growing cultural influence.

KEYWORDS: Anxiety; cancer; hypertension; pranayama; stress; yoga

PMID: 22891145 [PubMed] PMCID: PMC3415184 [Free PMC Article](#)



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Alejandro Chaoul, Ph.D

Assistant Professor in MD Anderson Cancer Centre's Integrative Medicine Program.

April 2013

Yoga strengthens your body and mind. But, can it also reduce your chances of getting cancer?

"We know that keeping a healthy weight and being active every day can help prevent cancer," says Alejandro Chaoul. "Some styles of yoga include postures and movements that may get your heart pumping. And, if your heart rate goes up for an extended period of time during yoga, you can count it as exercise."

"In addition, yoga is a mind-body practice that guides the body through a series of breathing exercises," Chaoul adds. "Doing these activities can help relieve stress and improve your overall health."

Other health benefits of yoga include:

Increased flexibility

Improved circulation

Improved mood

Improved sleep

Increased balance

Match your yoga style to your personality

Whether you want to lose weight or improve your flexibility, you can find a yoga class to match your fitness level.

Hatha yoga....

Ashtanga or Power Yoga....

Kundalini Yoga....

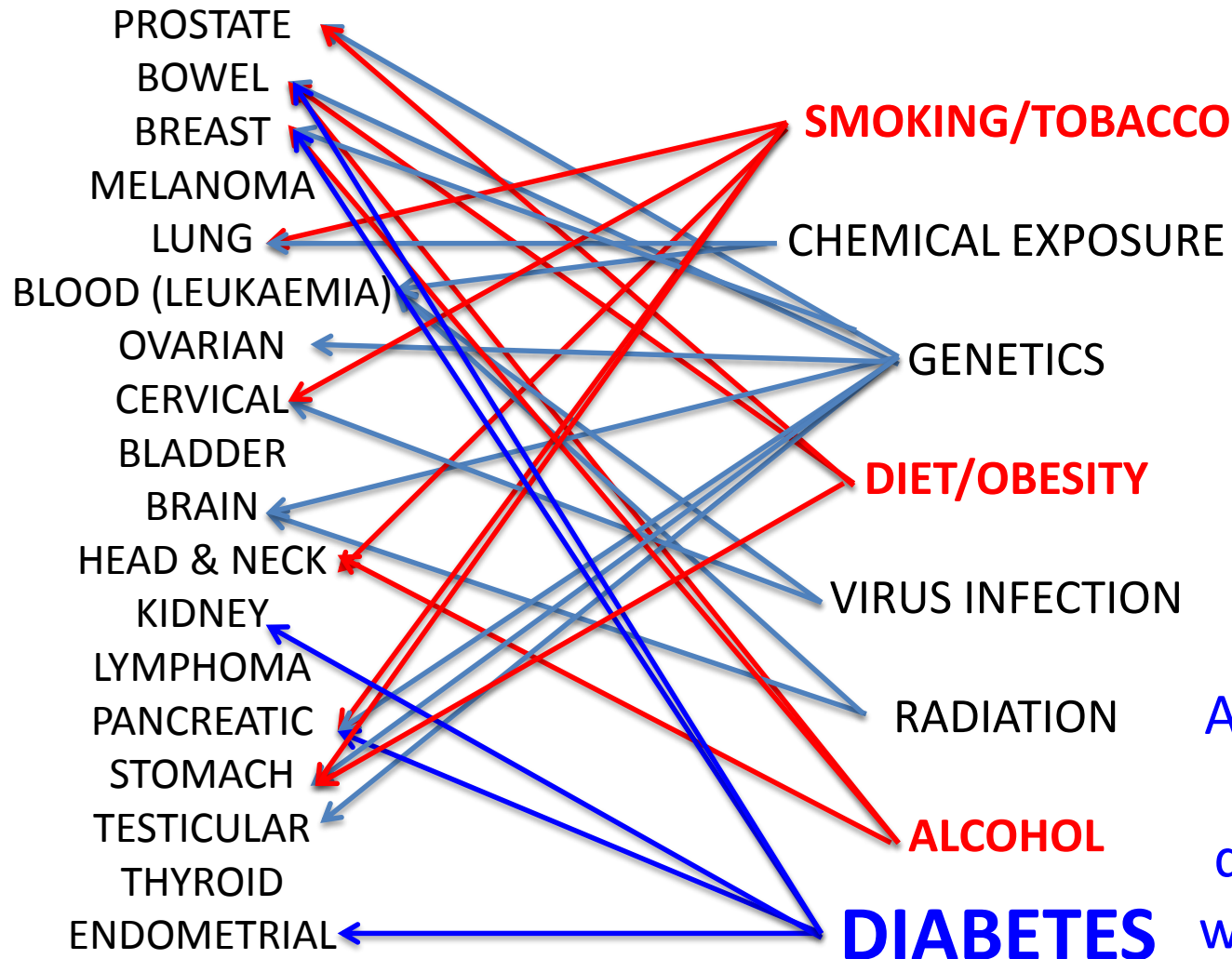
Bikram Yoga....

Tibetan Yoga....

"No one style of yoga is best," says Chaoul. "It's more important that you find a class and type that works for you."

Type of Cancer

Cause of Cancer



280
Australians
per day
diagnosed
with Type 2
Diabetes

Lifestyle and Cancer Risk Reduction

1. Quit smoking

- A big NO around children

2. Be sun smart

- Use sunscreen

3. Get active

- Yoga
- Brisk walking
- Cycling

4. Maintain a healthy diet

- Avoid processed food, frozen meals in supermarket freezers
- Reduce sugar intake, soft drinks
- Increase intake of green vegetables/ fruit
- Reduce red meat intake
- Eat organic food, grow your own vegetables where possible

5. Limit alcohol intake

More information

- Cancer Council Australia
<http://www.cancer.org.au/>
- Cancer Council NSW
<http://www.cancercouncil.com.au/>
- MD Anderson Cancer Centre, USA
<http://www.mdanderson.org/>