



Breast Cancer and Cannabis Treatments

Breast cancer has become the most common cancer in women in Australia and the second most common cancer to cause death in women, after lung cancer¹. Community awareness is growing on the seriousness of this cancer and the need for testing and screening, but the search continues for new treatment therapies for doctors and patients who are seeking alternative options. One alternative being researched is medical cannabis.

Let's explore a little more on what we know about breast cancer, the current treatment options and how medical cannabis can help.

What is Breast cancer?

Breast cancer is described as an abnormal growth of cells lining the breast lobules or ducts, which can grow uncontrollably and potentially spread to other parts of the body¹.

Many of us would assume that if we had no symptoms and no pain, it means nothing's wrong, right? Well unfortunately that is a common misconception - cancerous cells can live and grow undetected in a person's body for a decade or more². That's why practitioners are constantly trying to remind women to self-check their breasts and look for symptoms such as: new lumps or thickening in the breast or under the arm, nipple sores, nipple discharge or turning in, skin of the breast dimpling, and rash or red swollen breasts¹.

How many people have it?



Breast cancer is mainly associated with women but men can develop it too. It is estimated that in 2017, 17,586 women and 144 men will be diagnosed with breast cancer³. This means that approximately 17,730 Australians will be diagnosed with breast cancer in 2017, an average of 48 people every day³.

Developing breast cancer can vary depending on age, family history, inheritance of mutations in the genes, exposure to female hormones, obesity and alcohol consumption¹. The older you are, the higher the risk – according Breast Cancer Network Australia, by age 85, 1 in 8 women will develop breast cancer, and 1 in 631 for men³.

¹ Cancer Council Australia 2017, *Breast cancer*. Available from: <http://www.cancer.org.au/about-cancer/types-of-cancer/breast-cancer/>. [6 July 2017].

² The Angiogenesis Foundation 2012, *Cancer may grow undetected for a decade or more*. Available from: <https://angio.org/cancer-may-grow-undetected-for-a-decade-or-more/>. [17 July 2017].

³ Breast Cancer Network Australia 2017, *Understanding breast cancer*. Available from: <https://www.bcna.org.au/understanding-breast-cancer/>. [6 July 2017].



But there is good news. The survival rate from breast cancer is high – in Australia, the overall five year survival rate in females is 90%¹. This has increased from 72% in 1982-1987 to 90% in 2017³ – all thanks to new technologies and research.

Cannabis treatments

The most common treatment route is surgery, to remove the cancerous cells and adjuvant treatments such as hormone therapy, chemotherapy and radiotherapy, to reduce the chances of reoccurrence³. However, there are alternative medicines such as medicinal cannabis which has generated a lot of attention most recently as countries around the world have started to legalise its use for medical purposes.

The concept of medical cannabis isn't 'new', it has been around for centuries in countries such as China and India. Scientists discovered more than 104 different cannabinoids⁴ in the cannabis plant that can have different effects on the human body. For example, the main cannabinoids being THC and CBD can have the following health benefits⁵:

- **THC** can help relieve pain and nausea, reduce inflammation and can act as an antioxidant.
- **CBD** can help treat seizures, reduce anxiety and paranoia.

Recently, more studies have seen a correlation between cancer and medical cannabis. Many studies have found that medical cannabis can be helpful in treating nausea and vomiting from cancer chemotherapy⁴, and people who took cannabis extracts in the clinical trials tended to need less pain medicine⁵.

THC and CBD has proven to slow down the growth and/or cause death in certain types of cancer cells growing in lab dishes⁵. Some animal studies also suggest certain cannabinoids may slow growth and reduce spread of some forms of cancer⁴.

However more research is required to truly determine if medical cannabis can be an effective therapy for breast cancers.

⁴ The National Academic Press 2017, 'The health effects of cannabis and cannabinoids: the current state of evidence and recommendations for research', *Board on Population Health and Public Health Practice*. Available from: <http://www.nap.edu/24625>. [13 July 2017].

⁵ American Cancer Society 2017, *Marijuana and Cancer*. Available from: <https://www.cancer.org/treatment/treatments-and-side-effects/complementary-and-alternative-medicine/marijuana-and-cancer.html>. [12 July 2017].

Who is Zelda Therapeutics and how are they involved?



Zelda Therapeutics (“Zelda”) is an Australian-based bio-pharmaceutical company listed on the Australian Securities Exchange (ASX: ZLD). The company has secured exclusive, global access to an extensive set of human data related to medical cannabis based formulations and treatment protocols.

Zelda has undertaken ongoing research into the effects of cannabinoids against various types of human breast cancers. This research was undertaken in partnership with world-renowned researchers in the field at Complutense University in Madrid.

Initial results announced in November 2016, showed specific formulations of THC-rich oil was significantly more potent at reducing HER2+ breast tumour growth than pure THC and equally as potent as Lapatanib in reducing tumour growth in mice hosting HER2+ human tumours. Follow on studies announced in June 2017, reported more positive results, confirming there was significant anti-cancer effects across different breast cancer cell lines using both THC-rich and CBD-rich oils.

The results demonstrated the potential for cannabinoid-based therapies to be therapeutically beneficial in a broad spectrum of breast cancer types, including hormone receptor positive, HER2+ and Triple Negative cancer types.

- *Hormone Receptor Positive (ER+/PR+)* treated with surgery and chemotherapy agents - although resistance can build to standard drugs.
- *HER2+* treated with antibody drugs relatively high success rates.
- *Triple Negative* aggressive form of breast cancer with limited treatment options (only options are chemotherapy, radiation and surgery).

In particular, Zelda’s THC-rich formulation showed significantly greater anti-cancer effect than pure synthetic THC suggesting that full extracts have greater efficacy than pure compounds.

The anti cancer effect was consistent across all cancer sub-types suggesting a novel mechanism of action that could form the basis for the development for future therapies.

What's next?



Zelda's positive results provide support to continue the study of Zelda's cannabis based formulations as anti-cancer therapeutics in their own right or in combination with current chemotherapy and radiotherapy regimes.

The company is underway with an expanded *in vivo*/animal study examining the anti-cancer effect of Zelda's extracts compared to pure THC and pure CBD as well as certain chemotherapy agents against HER2+ and Triple Negative human tumours hosted in rodents.

Interested to know more?

Stay updated on Zelda's progress - visit the website: www.zeldatherapeutics.com