



This Information Sheet includes information on cancer screening, screening programmes and details about some of the new screening technologies currently available in New Zealand. Words in **bold** are explained in the Glossary at the end of this Information Sheet.

Key points

New technologies to screen for cancer are becoming more common. No new technologies thus far, have clear evidence demonstrating either reliable or accurate detection rates in the general population. There is also no clear evidence that use of these technologies reduces the **mortality rates** for cancer patients. There is also little balanced information given about the potential harms associated with the new screening technologies. **Over-diagnosis** and then **over-treatment** is a concern with any cancer screening. Until the evidence is clearer and stronger, the Cancer Society does not recommend the use of any screening technology other than those currently available as part of the National Screening Unit's programmes.

Definition of screening

Screening is:

- the testing of people who either do not have or have not recognised the signs or symptoms of the condition being tested for. They believe themselves to be well and free of the disease they are being screened for.
- the reduction of risk, for that person, for future ill health in relation to the condition being tested for, or to give information about the risk even though the risk cannot be altered.
- a whole system or programme of events (a process) that is necessary to achieve the lowering of the mortality and **morbidity** rate. It is a programme not a test.¹

All screening has both likely benefits and possible harms. The main benefit is reduction (a cut) in morbidity and mortality linked with the disease being screened for. The harms range from anxiety due to **false positive** results, to over-diagnosis and over-treatment of inconsequential (not likely to cause any harm) disease.² For any screening test, the benefits must outweigh the possible harms.

Screening programmes

Screening can be offered as part of a checked and controlled programme or can be '**opportunistic**' either at the suggestion of a health provider or at the request of a consumer. **Opportunistic screening**, for example prostate testing using the PSA (prostate specific antigen) test, is commonly done by general practitioners (GPs). A problem with opportunistic screening is that there is no way to ensure a consistent '**best practice**' screening pathway. Screening does not take place on its own. It has to be part of a pathway that includes the correct diagnostic and treatment services.

Screening programmes, such as BreastScreen Aotearoa, offer the reassurance of a closely watched and checked **screening pathway**. This pathway ensures all people who are screened have access to fast diagnostic services and then have a clear **treatment pathway**.³

New technologies

New screening technologies, to date, have not been used as part of any formal screening programmes. As most technologies are part of businesses, advertising is used to promote the use of the screening test. However, there is often little or no balanced information about the limits of the test, evidence of known benefits and any possible harms linked to test. Very few technologies have undergone **randomised controlled trial** (RCT) study to measure the test's ability to reduce the mortality and morbidity rates of

the target cancer. Most information that is available is technological in nature, that is, it only looks at technical issues in the use of the technology. Some information is anecdotal, which is describing what has been seen to happen or may look at case studies. Case studies only present what has happened to a small group of patients and doesn't usually compare them to other small groups.

None of these meet the '**Gold Standard**' for evidence (proof), which is RCT data. For some of these new technologies, research is ongoing to better understand their possible uses, as well as improving their effectiveness. However, to date, results have been disappointing with most tests providing unreliable results, with no clear improvements in **patient outcomes**.⁴⁻⁶ With more evidence this may change. But at this time, none of the technologies listed can be recommended as screening tools by the Cancer Society.

For all people concerned about finding cancer early, they should consider (think about) if taking part in a national screening programme is right for them. It is also important that everyone, no matter what their screening history, be aware of what is normal for their body. If any changes are noticed that last more than a couple of weeks, they should talk to their doctor.

New technologies include:

Thermography—use of changes in skin temperature to screen for breast cancer

Digital image capture—use of serial digital pictures of skin lesions to screen for skin cancer

Hyper florescence—use of various different light dispersal (or scattering) machines to detect changes in light uptake in screening for oral cancers

Biomarkers (proteomics)—testing blood or other fluids for a range of bio-chemicals or markers to screen for a number of cancers

Genetic testing—testing blood or other tissue for genetic abnormalities to screen for a number of cancers

CT colonography—use of CT (computed tomography) scanning to detect abnormalities in the colon.

For more information:

See The National Screening Unit website
<http://www.nsu.govt.nz>

Contact: Sarah Penno Screening and Early Detection Advisor DDI +64 4 494. 7191

Or contact the Cancer Information Helpline
0800 CANCER (226 237).

Glossary:

Best practice – What is generally acknowledged, and has been proven by research, to be the best way to achieve the best results.

Diagnostic – A type of test used to diagnose a specific condition or disease. A screening test is not usually diagnostic.

Gold standard – The highest and strongest level of evidence.

False positive – A test result that suggests cancer is present when it is, in fact, not. Also known as a 'cancer scare'.

False Negative – A test result that suggests a person does not have cancer when in fact they do.

Morbidity – The amount of sickness or ill health in a population, not including death. The term also includes the side effects of treatment.

Mortality rate – The rate of death in a population.

Opportunistic screening – When someone asks their doctor or health professional for a check or test, or a check or test is offered by a doctor or health professional.

Over-diagnosis – When screening diagnoses cases that would never have been diagnosed during a person's lifetime.

Over-treatment – When screening leads to treatment of cases that would never have caused a problem in a person's lifetime.

Patient outcomes – The end result of treatment following a diagnosis of a specific disease or condition.

Randomised controlled trial – An experiment where people are put in different groups on the basis of random (or chance) selection. This is the best way to make sure the different study groups are as similar as possible in the types of people who are in them. This makes the results truly reflect the experiment rather than any differences in the people taking part.

Risk reduction – The lowering of the chances that a person will develop a certain disease or condition.

Screening pathway – The whole set of activities and ways to change a situation that are linked with a screening test. This includes the screening test, tests for diagnosis, and any treatment that is needed.

Treatment pathway – The most effective individual plan of treatment.

1. Raffle, A and Muir Gray. J. A. (2007). *Screening: Evidence and Practice*. Oxford: Oxford University Press.
2. Jorgensen, K., and Gotzsche, P. (2009) Overdiagnosis in publicly organised mammography screening programmes: systematic review of incidence trends. *British Medical Journal*,. 339(jul09 1), b2587.
3. Cancer Society of New Zealand. (2005) *Criteria for Cancer Society of New Zealand Assessment, Endorsement and Identification of Action Relating to Cancer Screening*. Wellington. : Cancer Society of New Zealand.
4. Journal of the National Institute. (2010) The Cancer Biomarker Conundrum: Too Many False Discoveries. *Journal of the National Institute*, djq335.
5. Harris, R. (2010) Speaking for the Evidence: Colonoscopy vs Computed Tomographic Colonography. *J. Natl. Cancer Inst.* 102(16), 1212-1214.
6. Marcus, P., et al., (2006) Extended lung cancer incidence follow-up in the Mayo Lung Project and overdiagnosis. *JNCI Journal of the National Cancer Institute*, 98(11), 748.