Facts for people and families with a faulty TP53 gene (Li-Fraumeni syndrome)

ID: 3443 v.2 **Endorsed**

This fact sheet contains general information. Each person should be referred to a genetic service for further information and advice about what a faulty TP53 gene means for them.

Key Points

- People with a faulty TP53 gene have Li-Fraumeni syndrome.
- People with a faulty TP53 gene have an increased chance of developing many types of cancer.
- Women with a faulty TP53 gene have an increased chance of developing breast cancer.
- Family members (including children) can be referred to a genetic service where experts can provide information, support and advice about their chance of developing cancer and the option of genetic testing.

What is a faulty TP53 gene?

TP53 is a 'cancer protection' gene that helps to protect against many types of cancer.

Everyone has two TP53 genes (one from their mother, and one from their father). If one of the genes is not working, this is known as having a *faulty TP53 gene,* or a *TP53 mutation.*

What is the risk of cancer for men, women and children with a faulty TP53 gene?

- Children with a faulty TP53 gene have:
  - up to a 12% chance of developing soft tissue sarcoma and up to a 12% chance of developing bone sarcoma before age 18 years.
  - about an 8% chance of developing brain cancer before age 18 years.
  - about a 9% chance of developing cancer of the adrenal gland before age 18 years.
  - about a 3% chance of developing a cancer of the blood (such as leukaemia) before age 18 years.
  - a slightly increased chance of developing Wilms tumour, neuroblastoma, lung, bowel, stomach and/or pancreatic cancer before age 18 years but the exact chance is unknown.
- Adults with a faulty TP53 gene have:
  - about a 50% chance of developing soft tissue sarcoma and about a 10% chance of developing bone sarcoma over their lifetime.
  - a 20–30% chance of developing brain cancer over their lifetime.
  - up to a 25% chance of developing bowel cancer over their lifetime.
  - about a 15% chance of developing gastric (stomach) cancer over their lifetime.
  - a slightly increased chance of developing cancer of the adrenal gland, lung, prostate, kidney, pancreas, melanoma and/or blood cancer over their lifetime.
- Women with a faulty TP53 gene have about an 85% chance of developing breast cancer over their lifetime.

Overall, people with a faulty TP53 gene have:

- up to a 40% chance of developing any cancer by age 18 years.
- a 95% chance of developing any cancer by age 60 years.
- a 50% chance of developing a second cancer in the first 10 years after their first cancer.

How can this increased risk of cancer be managed for children with a faulty TP53 gene?

Cancer of the adrenal gland:

- To **find adrenal gland cancer early**, children with a faulty TP53 gene can consider screening every 4 months from birth to age 18 years. This involves having an abdominal ultrasound.

All cancers:

- Children with a faulty TP53 gene should have a check up with a specialist doctor every 4 months from birth to age 18 years. They should see a doctor immediately if they develop any worrying symptoms.

How can this increased risk of cancer be managed for adults with a faulty TP53 gene?

Breast cancer:

- To **find breast cancer early**, women with a faulty TP53 gene should have breast cancer screening every year from age 20 years. This involves having a breast MRI, plus a breast check by a doctor.
- To **reduce the chance of breast cancer,** women with a faulty TP53 gene may take medications such as tamoxifen or raloxifene. Some women may consider breast surgery (risk-reducing mastectomy or RRM).

Bowel cancer:

- To **find bowel cancer early**, people with a faulty TP53 gene should have bowel cancer screening every 2–5 years from age 20 years. This involves having a colonoscopy. Bowel cancer screening might start before the age of 20 years if there is a family history of young onset bowel cancer.

Stomach cancer:

- To **find stomach cancer early**, people with a faulty TP53 gene who have a family history of stomach cancer should have their stomach screened every 2–5 years from age 25 years. This involves having a gastroscopy.

All cancers:

- Adults with a faulty TP53 gene should have a check up with a specialist doctor every year and should see a doctor immediately if they develop any worrying symptoms.

How can the increased risk of other cancers be managed for children and adults with a faulty TP53 gene?

- To **find brain cancer early**, children and adults with a faulty TP53 gene should have screening every six months. This involves having an alternating brain and whole-body MRI.
- To **find other cancers early**, children and adults with a faulty TP53 gene should have screening every year. This involves having a whole-body MRI.
- To **reduce the chance of developing cancer**, people with a faulty TP53 gene should not smoke. They should also avoid unnecessary radiation and excessive sun exposure.

What does this mean for family members?

Family members (including children) of someone with a faulty TP53 gene can have genetic testing to check who has the faulty gene and who does not. Their doctor can refer them to a genetic service to find out more about their chance of developing cancer and what genetic testing involves.

If a person **does have** the faulty TP53 gene:

- they can pass it on to their children
- each child has a 50% (or 1 in 2) chance of being born with it. Pregnancy planning options are available to people who want to prevent the faulty gene from being passed on.

If a person **does not have** the faulty TP53 gene:

- they have the same chance of developing cancer as the general population (unless there are other factors that increase this risk)
- they cannot pass it on to their children.

People who decide not to have genetic testing should still get advice about managing their chance of developing cancer.

More information and support

- Centre for Genetics Education NSW Health: Contact details for local genetics services –genetics.edu.au/SitePages/Genetic-Services.aspx
- Genetic Alliance Australia – geneticalliance.org.au
- Cancer Australia – canceraustralia.gov.au
- LFS Association – lfsassociation.org
- COSA - Medications to lower the chance of breast cancer: information for women – cosa.org.au/groups/cancer-genetics/resources/

History

Version 2

Date	Summary of changes
20/05/2022	Consumer information sheet reviewed in line with risk management protocols (ID 749 and 1349). Approved for publication with the following changes made: • What is the risk of cancer for men, women and children with a faulty TP53 gene? ◦ Updated figures for soft tissue sarcoma, bone sarcoma, cancer of the adrenal gland and cancer of the blood ◦ Updated figure for overall chance of developing cancer by age 18 years • How can this increased risk of cancer be managed for children with a faulty TP53 gene? ◦ Adrenal gland: 'screening every 4 months from birth to age 10 years' changed to ' screening every 4 months from birth to age 18 years' ◦ All cancers: added 'check up with a specialist doctor...' • How can this increased risk of cancer be managed for adults with a faulty TP53 gene? ◦ All cancers: added '...have a check up with a specialist doctor every year...' • How can this increased risk of cancer be managed for children and adults with a faulty TP53 gene? ◦ Brain cancer: '...can consider screening every year. This involves having a brain MRI.' changed to '...should have screening every six months. This involves having an alternating brain and whole-body MRI.' ◦ Other cancers: '...can consider screening every year.... ' changed to '...should have screening every year...' Version increased to V.2. To be reviewed alongside ID 749 and ID 1349 when next due for review.

Version 1

Date	Summary of changes
28/06/2019	Developed in conjunction with consumer information sheet working group and presented at the November 2017 Cancer Genetics meeting. Document held off from publication and then reviewed alongside TP53 risk management protocols (ID 749 + 1349) in Nov 2018. Approved for publication as V.1.
12/05/2021	More information and support: Link to COSA - Medications to lower the chance of breast cancer: information for women inserted

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