



SAPATHOLOGY

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Familial Cancer Unit

Risks of breast or ovarian cancer for women with a BRCA2 mutation

This leaflet has been written as an aid for women who have attended an appointment with a genetic counsellor. The leaflet does not replace the need for such face-to-face counselling by an experienced genetic counsellor or cancer geneticist. Please contact the Unit if you wish to discuss these matters at another appointment or by phone.

Who is this leaflet for?

This leaflet is for a woman who has an inherited mutation in the BRCA2 gene and has not had cancer. It summarises the risk of cancer associated with having such a mutation. The short-term and long-term risks of developing breast and ovarian cancer are presented for women of different ages. This information may be useful in helping you decide what to do regarding these risks.

Please note that this leaflet does not discuss what you can do about these risks of cancer. It simply outlines the different risks for women of different ages.

Risks can be confusing

Talking about "risks" is not simple. It is clear that many people find it confusing to deal with possibilities rather than certainties. For example, even if something is very likely to happen, there is still the possibility that it may not. A rare but serious problem may be of more concern than a common but less serious one.

Risks can also be presented in different ways, including percentages (eg "50%"), odds ("one chance in two"), words ("equal chance of happening or not happening"), or as graphs. Risks can also be presented as "the risk in the next year" or as "the risk by the time you reach a certain age"; we use both methods in this leaflet.

Everyone is different

It is also important to note that the information in this leaflet is not "the final word" on cancer risks for women with a BRCA2 mutation. Every family and every woman are different. There may be factors in your own medical history or your family's experience that would modify the risks outlined below.

For these reasons, we strongly recommend that you discuss these risks and your options with a health professional experienced in these matters. Do not simply rely on this leaflet.

Where did this information come from?

The information in this leaflet comes from a major American study published in 2006 and from Australian data (2001) on the frequency of breast and ovarian cancer. We can provide you with copies of this technical information if you wish.

Please note that this leaflet provides information available at the time (2006). This information will change in the future. Please contact the Unit if you require updated information.

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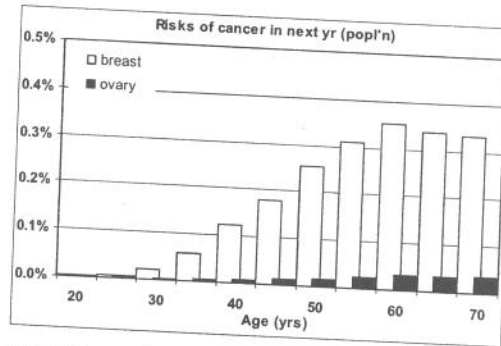
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Risks in the general population

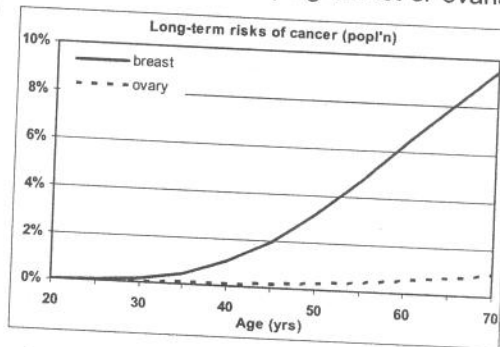
For a woman in the general population, the risk of developing breast or ovarian cancer in any year gradually increases with age. In the following table, this short-term risk is expressed as odds eg for the average Australian woman in her 40s, the chance of her developing breast cancer in the following year is approximately 1 in 600 (or 0.17% per year). The same information is presented as % risk in the adjacent graph.

Age	Risk of breast cancer in next yr	Risk of ovarian cancer in next yr
20s	1 in 15,000	1 in 23,000
30s	1 in 1,700	1 in 20,000
40s	1 in 600	1 in 7,000
50s	1 in 300	1 in 4,000
60s	1 in 300	1 in 3,000



Please note that this is the short-term risk of cancer in the next year. If she does not develop breast cancer that year, then her risk the following year is still 1 in 600 (unless she turns 50 and shifts to a higher risk). Also note that the risk of the average woman developing breast or ovarian cancer during one year is much less than 1 in 100 (i.e. less than 1%) at every age.

This graph shows the long-term risk of a woman developing breast or ovarian cancer by a certain age. It answers the question: *What is the risk of the average young woman developing breast or ovarian cancer by a specified age?* The risk of a young woman developing breast cancer by the age of 70 is 10% (or 1 chance in 10). Her risk of developing ovarian cancer by the same age is 1% (1 chance in 100).



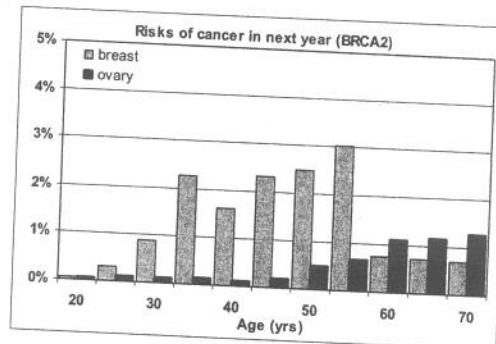
Short-term risks for a woman with a BRCA2 mutation

The short-term risks of cancer are higher for a woman who carries a BRCA2 mutation, and the trends with age are very different from those in the general population.

For a BRCA2 carrier, the approximate risk of developing breast or ovarian cancer in the next year is shown in the table. This risk has been expressed as odds eg for a carrier in her 40s, the short-term risk of developing breast cancer in the next year is approximately 1 in 40. The same information is presented as % risk in the adjacent graph.

Age	Risk of breast cancer in next yr	Risk of ovarian cancer in next yr
20s	1 in 300	1 in 1,000*
30s	1 in 40	1 in 700
40s	1 in 40	1 in 500
50s	1 in 30	1 in 150
60s	1 in 140	1 in 90

* estimate based on limited information



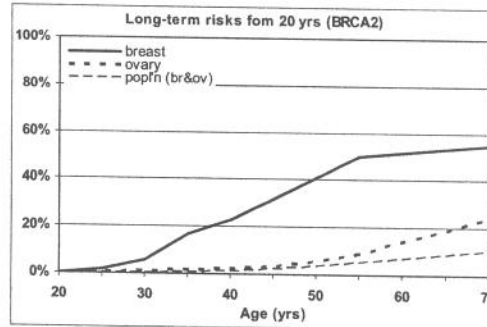
The risks of both breast and ovarian cancer are much higher than in the general population. There are also other important differences.

- First, the annual risk of breast cancer is higher in mid-adult life than in the 60s (or older). For a carrier in her 30s, her risk of developing breast cancer in the next year is approximately 2%. Once she reaches the age of 60, the annual risk of breast cancer drops to less than 1%.
- Second, the annual risk of ovarian cancer is initially much lower than the risk of breast cancer. But the risk of ovarian cancer continues to increase with age. By the age of 60 her risk of ovarian cancer in the next year has reached 1% and she is at greater risk of ovarian cancer in the next year than of breast cancer.

Long-term risks for a BRCA2 carrier aged 20

This graph shows the long-term risk of an unaffected woman aged 20 developing breast or ovarian cancer by a certain age.

- Her risk of developing breast cancer by the age of 30 is approximately 6% (or 6 chances in 100). Her risk of developing ovarian cancer by the same age is 1% (1 chance in 100).
- Her risk of developing breast cancer by the age of 70 is approximately 50% (or 1 chance in 2). Her risk of developing ovarian cancer by the same age is 25% (1 chance in 4).

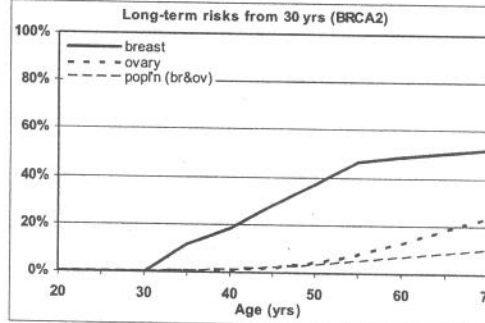


This graph (and those which follow) also shows the long-term risk of a woman in the general population developing breast or ovarian cancer by a certain age. This is included for comparison.

Long-term risks for a BRCA2 carrier aged 30

This graph shows the long-term risk of an unaffected woman aged 30 developing breast or ovarian cancer by a certain age. This graph is different from that for the 20 year-old because this woman has already reached the age of 30 without developing cancer.

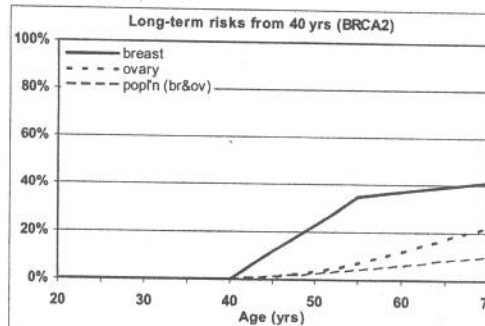
In the next decade, her risk of developing breast cancer in any year is 1-2%. Her risk of developing breast cancer by the age of 40 is approximately 20%. Her risk of developing ovarian cancer by that age is 1%.



Long-term risks for a BRCA2 carrier aged 40

This graph shows the long-term risk of an unaffected woman aged 40 developing breast or ovarian cancer by a certain age. This graph is different from the earlier graphs because this woman has already reached the age of 40 without developing cancer.

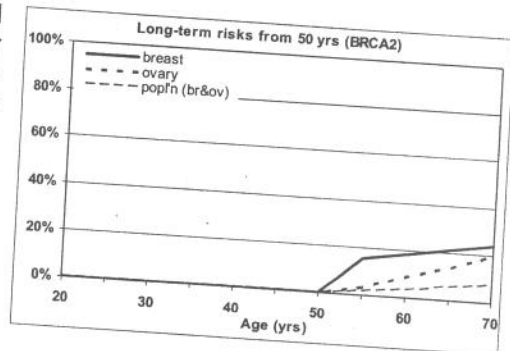
In the next decade, her risk of developing breast cancer in any year is 2%. Her risk of developing breast cancer by the age of 50 is approximately 20%. Her risk of developing ovarian cancer by that age is 3%.



Long-term risks for a BRCA2 carrier aged 50

This graph shows the long-term risk of an unaffected woman aged 50 developing breast or ovarian cancer by a certain age. This graph is different from the earlier graphs because this woman has already reached the age of 50 without developing cancer.

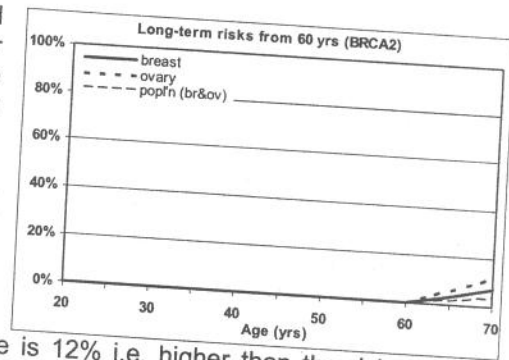
In the next decade, her risk of developing breast cancer in any year is 2-3%. Her risk of developing breast cancer by the age of 60 is approximately 20%. Her risk of developing ovarian cancer by that age is 9%.



Long-term risks for a BRCA2 carrier aged 60

This graph shows the long-term risk of an unaffected woman aged 60 developing breast or ovarian cancer by a certain age. This graph is different from the earlier graphs because this woman has already reached the age of 60 without developing cancer.

In the next decade, her risk of developing breast cancer in any year is less than 1%. Her risk of developing breast cancer by the age of 70 is approximately 5%. This is similar to the risk of breast or ovarian cancer in the general population. But her risk of developing ovarian cancer in the next decade is 12% i.e. higher than the risk of breast cancer.



Risks for a BRCA2 carrier aged 70

We do not have sufficient information to provide specific advice about short- and long-term risks for a woman aged 70 or older. The trends that have been presented in the other graphs would probably apply i.e. the risks for an unaffected 70-year old would be similar (but lower) than the risks for an unaffected 60-year old.

Is this information useful?

You may find this information helpful when you are considering what action to take about your own cancer risk. For example,

- a carrier aged 30 is at relatively high risk of developing breast cancer and may be considering a prophylactic mastectomy. In the short term, her risk of developing breast cancer in the next year is only 1%, and she may decide to defer such surgery while she completes her child-bearing. But in the longer term, the risk of breast cancer by the age of 40 suggests that a decision about surgery will need to be made in the next 5-10 years.
- For an older woman, the risk of breast cancer is falling and there may be little benefit from a prophylactic mastectomy. But a major hazard over the age of 60 or so is ovarian cancer, and a prophylactic oophorectomy may be worthwhile.

But please remember our opening caution: **Discuss your personal situation with an experienced counsellor or medical specialist.** This leaflet does not attempt to consider the various options available to women of different ages and in different situations. Your doctor or counsellor can help you decide what to do to reduce your chance of developing cancer, and to identify a cancer that might occur while it is at an early, curable stage.