Benefits and Harms of PSA Screening

The Canadian Task Force on Preventive Health Care recommends against screening for prostate cancer with the PSA test

• The CTFPHC found that the potential small benefit from PSA screening is outweighed by the potential significant harms of the screening and associated follow-up treatment.
• Men should understand that PSA screening may result in additional testing if the PSA level is raised.
• To save one life we would need to diagnose an additional 27 men with prostate cancer

**RESULTS OF SCREENING 1,000 MEN WITH THE PSA TEST**
(age 55–69 years, screened over a 13-year period, and with a PSA screening threshold of 3.0 ng/ml)

- 720 men will have a negative PSA test
- 178 men with a positive PSA in whom follow-up testing does not identify prostate cancer
- 4 of these 178 will experience biopsy complications such as infection and bleeding severe enough to require hospitalization
- 102 men will be diagnosed with prostate cancer
- 33 of these 102 prostate cancers would not have caused illness or death
- 5 men will die from prostate cancer despite undergoing PSA screening
- 1 man will escape death from prostate cancer because he underwent PSA screening
- What are my risks if I don’t get screened?
  - Among men who are screened with the PSA test, the risk of dying from prostate cancer is 5 in 1,000
  - Among men who are not screened with the PSA test, the risk of dying from prostate cancer is 6 in 1,000

**Complications of treatment for prostate cancer**

For every 1,000 men who receive treatment for prostate cancer:
- 114–214 will have short-term complications such as infections, additional surgeries, and blood transfusions
- 127–442 will experience long-term erectile dysfunction
- up to 178 will experience urinary incontinence
- 4–5 will die from complications of prostate cancer treatment

Statistics for benefits and harms were calculated from the European Randomized Study of Screening for Prostate Cancer (ERSPC).
We recommend screening for lung cancer using low-dose computed tomography (low-dose CT) in adults who

- are aged 55–74
- are current smokers or former smokers who quit within the last 15 years
- have smoked one pack a day for at least 30 years (or two packs a day for 15 years or equivalent; i.e., 30 “pack-years”)

If you think you meet all of these criteria, you should talk to your primary care provider about being screened once a year for up to three years in a row.

We do not recommend being screened for lung cancer with a chest x-ray.

1. What is low-dose CT and why should I be screened with it?
   - Low-dose CT is a very detailed scan of your lungs and it can pick up much more than a chest x-ray can.
   - By being screened with low-dose CT, you are more likely to detect lung cancer when the disease is at an early stage, which can make treatment more successful.

2. Why should I not be screened with chest x-ray?
   - There is no demonstrated benefit of screening for lung cancer with chest x-ray (e.g., better survival after treatment), an abnormal chest x-ray test result could lead to harms from an invasive follow-up test.

3. Why should I be screened only once a year for 3 years?
   - Currently, we have evidence only on the benefits and harms of annual screening for three years in a row.

4. What happens if I receive a positive low-dose CT scan result?
   - Most people who receive a positive low-dose CT scan result do not really have lung cancer (these are called false positives).
   - If you receive a positive scan result, you may go through additional testing to confirm whether or not you have lung cancer. Some of these follow-up tests can be invasive, and there is a risk of major complications or, possibly, death.

To access our guidelines, tools, and resources, visit our website at www.canadiantaskforce.ca or download the free CTFPHC mobile app on iTunes or Google Play.
Should I be screened with mammography for breast cancer?

For women between 40 and 49 years of age:

Among women who do not screen, the risk of dying from breast cancer is: 1 in 313

With regular screening your risk of dying of breast cancer is: 1 in 370

However, with regular screening:

... your risk of having a false positive mammogram requiring further screening is: 1 in 3

... your risk of having a biopsy is: 1 in 28

... your risk of having part or all of a breast removed unnecessarily is: 1 in 200

Be informed!

You may hear the risks or benefits of breast cancer screening described as either absolute or relative. But what does all this mean and how does it apply to you?

The main difference is that absolute risk takes into consideration the fact that whether or not you get screened or treated, you still have a baseline risk of dying of breast cancer: 1 in 313 or 0.32%. With regular screening that risk changes to: 1 in 370 or about 0.27%. Relative risk does not consider baseline risk in the same way and may lead to confusion about how regular screening reduces risk.

The absolute risk is simply the difference in risk between regular screening (0.27%) and no screening (0.32%).

\[
0.32\% - 0.27\% = 0.05\%
\]

Therefore screening in women aged 40-49 reduces your absolute risk of dying of breast cancer by 0.05%. So the absolute benefit of screening is 0.05%.

Relative risk only looks at the reduction in risk as a proportion of the total risk (so it doesn’t consider that you are already at risk of cancer, this can lead to larger values than absolute risk).

\[
0.05\% / 0.32\% = 15\%
\]

Thus, screening in women aged 40-49 reduces your relative risk of dying of breast cancer by 15%. So the relative benefit of screening is 15%.

So how does this translate into actual numbers? Among 100 000 women aged 40 to 49 who are:

Screened EVERY 2 years for 11 years:
- 270 would die of breast cancer
- 32 700 would experience a false alarm
- 3600 would have a biopsy
- 500 would have part or all of a breast removed without having cancer
- 50 would escape a breast cancer death

NOT screened for 11 years:
- 320 would die of breast cancer
- 99 680 would not

For more info visit: http://www.canadiantaskforce.ca
Absolute Benefit of Screening with Mammography

If we wanted to describe the previous information in regards to the effect on an individual woman then we can look at what would occur in a base of 2100 women instead of 100 000.

In the graphic below, each dot represents 1 woman ( ● = 1 woman)

If we screened 2100 women, aged 40-49 years, at average risk of breast cancer every two years for 11 years...

...about 700 women would experience a false positive mamogram requiring further imaging...

...75 of these women would have a biopsy, all to confirm that they do not have breast cancer

...at least 10 women would have part or all of a breast unnecessarily removed and bear the burden of over-diagnosis

...1 woman would escape a breast cancer death

For more information visit: http://www.canadiantaskforce.ca
For women between 50 and 69 years of age:

Among women who do not screen, the risk of dying from breast cancer is: 1 in 155
With regular screening your risk of dying of breast cancer is: 1 in 196

However, with regular screening:
... your risk of having a false positive mammogram requiring further screening is: 1 in 4
... your risk of having a biopsy is: 1 in 28
... your risk of having part or all of a breast removed unnecessarily is: 1 in 200

Be informed!

You may hear the risks or benefits of breast cancer screening described as either absolute or relative. But what does all this mean and how does it apply to you?

The main difference is that absolute risk takes into consideration the fact that whether or not you get screened or treated, you still have a baseline risk of dying of breast cancer: 1 in 155 or 0.64%. With regular screening that risk changes to: 1 in 196 or about 0.51%. Relative risk does not consider baseline risk in the same way and may lead to confusion about how regular screening reduces risk.

Risk of Breast Cancer

The absolute risk is simply the difference in risk between regular screening (0.47%) and no screening (0.64%).

\[0.64\% - 0.51\% = 0.13\%\]

Therefore screening in women aged 50-69 reduces your absolute risk of dying of breast cancer by 0.13%.
So the absolute benefit of screening is 0.13%.

Relative risk only looks at the reduction in risk as a proportion of the total risk (so it doesn’t consider that you are already at risk of cancer, this can lead to larger values than absolute risk).

\[0.13\%/0.64\% = 21\%\]

Thus, screening in women aged 50-69 reduces your relative risk of dying of breast cancer by 21%. So the relative benefit of screening is 21%.

So how does this translate into actual numbers? Among 100 000 women aged 50 to 69 who are:

Screened EVERY 2 years for 11 years:
- 510 would die of breast cancer
- 28 200 would experience a false alarm
- 3700 would have a biopsy
- 500 would have part or all of a breast removed without having cancer
- 138 would escape a breast cancer death

NOT screened for 11 years:
- 640 would die of breast cancer
- 99 360 would not

For more info visit: http://www.canadiantaskforce.ca
Should I be screened with mammography for breast cancer?

Absolute Benefit of Screening with Mammography

If we wanted to describe the previous information in regards to the effect on an individual woman then we can look at what would occur in a base of 720 women instead of 100,000.

In the graphic below, each dot represents 1 woman (● = 1 woman)

If we screened 720 women, aged 50-69 years, at average risk of breast cancer every two years for 11 years...

...about 204 women would experience a false positive mammogram requiring further imaging...

...26 of these women would have a biopsy, all to confirm that they do not have breast cancer

...at least 4 women would have part or all of a breast unnecessarily removed and bear the burden of over-diagnosis

...1 woman would escape a breast cancer death

For more information visit: http://www.canadiantaskforce.ca
Screened EVERY 2 years for 11 years:

- 2600 would die of breast cancer
- 460 would die of breast cancer

21 200 would experience a false alarm

222 would escape a breast cancer death

NOT screened for 11 years:

- 89 320 would die of breast cancer

So how does this translate into actual numbers? Among 100,000 women aged 70 to 74 who are:

- 500 would have part or all of a breast removed without having cancer
- 680 would die of breast cancer

Canadians Task Force on Breast Cancer
http://www.canadianstaskforce.ca

For women between 70 and 74 years of age:

- 1 in 146
- 1 in 5
- 1 in 38
- 1 in 217
- 1 in 200

Should I be screened with mammography for breast cancer?

Risk of Breast Cancer

The main difference is that absolute risk takes into consideration the fact that whether or not you get regular screening or treated, you still have a baseline risk of dying of breast cancer: 1 in 217 or 0.46%. With regular screening, the absolute risk of dying of breast cancer is: 0.68% - 0.46% = 0.22%. Relative risk only looks at the reduction in risk as a proportion of the total risk (so it doesn’t consider that you are already at absolute risk of dying of breast cancer by 0.22%).

So the absolute benefit of screening is 32%.

You may hear the risks or benefits of breast cancer screening described as either absolute or relative. But what does all this mean and how does it apply to you?”

http://www.canadianstaskforce.ca

For more info visit:
Should I be screened with mammography for breast cancer?

Absolute Benefit of Screening with Mammography

If we wanted to describe the previous information in regards to the effect on an individual woman then we can look at what would occur in a base of 450 women instead of 100 000.

In the graphic below, each dot represents 1 woman (○ = 1 woman)

If we screened 450 women, aged 70-74 years, at average risk of breast cancer every two years for 11 years...

...about 90 women would experience a false positive mammogram requiring further imaging...

...11 of these women would have a biopsy, all to confirm that they do not have breast cancer

...at least 2 women would have part or all of a breast unnecessarily removed and bear the burden of over-diagnosis

...1 woman would escape a breast cancer death

For more information visit: http://www.canadiantaskforce.ca