

RADIOTHERAPY FOR PRIMARY BREAST CANCER



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ABOUT THIS BOOKLET

This booklet explains what radiotherapy is, when and how it's given, and its possible side effects. You may also find it helpful to read our **Treating primary breast cancer** booklet for an overview of breast cancer treatment.

WHAT IS RADIOTHERAPY?

Radiotherapy uses high-energy x-rays to destroy cancer cells.

It's given to destroy any cancer cells that may have been left in the breast and surrounding area after surgery. You may hear this called adjuvant radiotherapy.

This booklet is about radiotherapy for primary breast cancer. This is breast cancer that has not spread beyond the breast or the lymph nodes (glands) under the arm.

WHEN IS RADIOTHERAPY GIVEN?

Radiotherapy is given after surgery to reduce the risk of breast cancer coming back.

If you're having chemotherapy after surgery, radiotherapy is usually given after the chemotherapy.

If you don't need chemotherapy, radiotherapy will usually start four to eight weeks after surgery.

Your specialist or breast care nurse will explain when you will start radiotherapy.

Radiotherapy may be delayed for a medical reason, for example if you need to wait for a wound to heal or if you develop a seroma (a collection of fluid that sometimes forms under a wound after an operation).

Radiotherapy may not be suitable if:

- You have previously had radiotherapy to the same area
- You have a medical condition that could make you particularly sensitive to its effects
- You're pregnant
- You have been told you have an altered TP53 gene

WHICH AREAS ARE TREATED?

When deciding which areas to treat and how, your treatment team will consider factors such as the location, grade, size and stage of your cancer.

You can find out more about how treatment decisions are made in our booklet **Understanding your pathology results**.

After breast-conserving surgery

If you had breast-conserving surgery (a wide local excision or lumpectomy) you will usually have radiotherapy to the remaining breast tissue on that side.

Your specialist may consider giving radiotherapy to the area of the breast where the cancer was removed, rather than the whole breast area. This is known as partial breast radiotherapy. It may be considered if the risk of the cancer coming back is low and you're going to be taking hormone (endocrine) therapy for at least five years.

People with a very low risk of the cancer coming back may not need radiotherapy after breast-conserving surgery. Your specialist will discuss your risk and explain whether radiotherapy is needed.

After a mastectomy

If you had a mastectomy for an invasive breast cancer, your specialist may recommend you have radiotherapy to the chest wall.

This may be the case if:

- The cancer was large or near the chest wall
- There's a high risk that cancer cells may have been left behind after surgery
- Cancer is found in the lymph nodes under the arm
- You have a type of cancer called inflammatory breast cancer

If you're having breast reconstruction, radiotherapy may affect the timing and type of reconstruction. See our **Breast reconstruction** booklet for more information.

Radiotherapy to the lymph nodes

Radiotherapy can be given to the lymph nodes under the arm to destroy any cancer cells that may be there.

It may also be given to the lymph nodes in the lower part of the neck around the collarbone, or in the area near the breastbone (sternum).

If radiotherapy to the lymph nodes is recommended, your specialist will explain why.

HOW IS RADIOTHERAPY GIVEN?

Radiotherapy can be given in several ways and using different doses.

The total dose of radiotherapy is split into a course of smaller treatments. These are called fractions.

It's carried out by people trained to give radiotherapy, known as therapeutic radiographers.

Radiotherapy is not available in every hospital, but each breast unit is linked to a hospital that has a radiotherapy department so you may have to travel for treatment.

You'll normally be given your treatment at hospital as an outpatient.

External beam radiotherapy (EBRT)

External beam radiotherapy (EBRT) is the most common type of radiotherapy used to treat primary breast cancer.

X-rays are delivered by a machine which directs beams of radiation at the breast area.

The x-rays from EBRT do not make you radioactive. When you leave the treatment room you can safely mix with other people, including children.

Intensity modulated radiotherapy (IMRT)

Intensity modulated radiotherapy (IMRT) is another way of giving external beam radiotherapy.

The dose (intensity) of radiotherapy can be varied (modulated), allowing different amounts of radiation to be given to different areas.

IMRT is not available in all radiotherapy treatment centres.

Volumetric modulated arc therapy (VMAT)

This is a type of IMRT. The radiotherapy machine rotates round the area being treated, continuously changing the shape and intensity of the radiation beams.

Other ways of giving radiotherapy

The following types of radiotherapy are less commonly used and are not widely available, but may be discussed with you.

Intraoperative radiotherapy

Intraoperative radiotherapy uses low-energy x-rays given from a machine in the operating theatre during breast-conserving surgery.

Radiotherapy is given directly to the area inside the body where the cancer was after it has been removed. Usually a single dose of radiation is given in one treatment. Sometimes you may also need a short course of external beam radiotherapy (EBRT) to the rest of the breast.

Intraoperative radiotherapy is not suitable for everyone and is not standard treatment.

Brachytherapy

Brachytherapy involves placing a radiation source inside the body in the area to be treated.

Narrow, hollow tubes or a small balloon are put in the body where the breast tissue has been removed. Radioactive wires are inserted through the tubes or into the balloon. The radioactive wires may be left in place for a few days or inserted for a short time each day. The tubes or balloon are removed after your radiotherapy treatment is finished.

Depending on the type of brachytherapy you have, you may need to have your treatment as an inpatient and be kept in a single room for a short time due to the radiation.

Brachytherapy is currently only given as part of a clinical trial. If brachytherapy is an option your specialist will discuss it with you.

HOW LONG WILL I HAVE RADIOTHERAPY FOR?

Radiotherapy is usually given daily over one to three weeks. It will be given Monday to Friday with a break at weekends. Most hospitals do not give radiotherapy on bank holidays.

You may have radiotherapy for longer if you need an extra boost.

Depending on local guidelines and your personal situation, your radiotherapy may be given in a slightly different way. For example, you may have a smaller daily dose over a longer period of time.

Your specialist will explain how long you will have radiotherapy for and why.

Your appointments may be arranged for a similar time each day so you can settle into a routine but this isn't always possible.

If you have a holiday booked, tell your specialist or therapeutic radiographer so that together you can decide what arrangements to make.

It is important to attend all your radiotherapy appointments and avoid any gaps in the treatment as much as possible.

BEFORE TREATMENT STARTS

Your specialist will explain the details of the treatment, its benefits, risks and potential side effects. You will then be asked to sign a consent form.

There may be some questions you want to ask your treatment team – we have included a list of suggestions on page 8.

When you have your first appointment with the specialist you may be asked if you would like to take part in a clinical trial.

For information on clinical trials see our website **breastcancernow.org** You can also search for current UK trials at cancerresearch.org.uk

Questions you may want to ask your treatment team

- Why are you recommending radiotherapy for me?
- What are the benefits and risks?
- Are there any clinical trials I could take part in?
- Which area will be treated?
- How is treatment given?
- How long will the radiotherapy take and how often will each treatment be given?
- How long will I have to wait before starting treatment?
- Which hospital will I have radiotherapy at?
- Will having radiotherapy affect my reconstructed breast or my options for breast reconstruction in the future?
- What are the side effects?
- Will I need to have radiotherapy tattoos (see page 9)?
- What is my risk of developing lymphoedema (see page 18)?

If you'd prefer to have female radiographers during your radiotherapy treatment, talk to your treatment team during the planning appointment about this. It may not always be possible, but they will try their best to make sure you feel comfortable.

Treatment planning

Treatment planning helps identify the exact area to be treated and the most effective dose of radiation, while limiting the amount of radiation to surrounding tissues.

Treatment planning is usually done using a CT (computerised tomography) scanner.

The planning session will take between 15 minutes and an hour.

You'll need to lie very still while your arms are positioned above your head and supported in an arm rest. You may be asked to raise only the arm on the side being treated. You may be asked to hold your breath for a short period of time (see page 11).

If you have a pacemaker, implantable cardioverter defibrillator (ICD) or you think you might be pregnant, tell your specialist or therapeutic radiographer before your planning appointment.

Marking the area

When the area of treatment has been decided, it's important to position you precisely for each treatment.

To do this, permanent ink markings (tattoos) are made on your skin. It's usually done by making three tiny dots using a pinprick of ink. Some women prefer to have their radiotherapy tattoos removed after finishing their treatment. Tattoo removal is not routinely available on the NHS and the results can vary.

Newer techniques that don't use tattoos to mark the area are being used in some hospitals. However, these are not widely available. Your specialist will discuss this if it is an option for you.

Regaining arm movement

It's important that you've regained your arm movement after surgery and can comfortably raise your arm above your head before you start radiotherapy. This is so treatment can be given to the whole breast or chest area.

After surgery it can be difficult or painful to lift your arm above your head and keep it there. You will be given exercises to help regain arm and shoulder movement. If your arm movement isn't improving you can talk to your breast care nurse or ask to see a physiotherapist. You can also take pain relief before each appointment to help you feel more comfortable holding the position.

Our **Exercises after breast cancer surgery** leaflet can help you regain arm and shoulder movement after surgery.

DURING TREATMENT

Once the planning and marking up is complete, your radiographer will arrange your first treatment appointment.

Getting into position

You'll be asked to undress above the waist and may be given a gown to wear. It can be helpful to wear a top that's easy to take off and put on. You may be able to request female radiographers if you would prefer.

You'll lie down on the treatment couch with your arms or arm above your head. The therapeutic radiographer will adjust the gown to expose the area to be treated. They'll help position you carefully, so that each time you have treatment you're in the same position.



Having radiotherapy

You'll need to stay very still during treatment, but you can breathe normally unless you're asked to do the breath hold technique (see below). Treatment takes only a few minutes.

Radiotherapy to the breast or chest wall is usually given from a number of different angles. The radiographer will reposition the machine for each angle.

The radiotherapy machine makes a buzzing noise while it's on. The machine may come quite close to you and even touch you. However, you won't feel the radiotherapy being given. You may feel a little uncomfortable staying in the same position.

Although you'll be left alone in the room, cameras will allow the radiographers to watch you on a television screen. Most radiotherapy departments also have an intercom system so that you and the radiographers can talk to each other and stop the treatment if needed.

The radiographers treating you will check how you are before each treatment. They can also answer any questions you have. They'll give you advice on side effects and arrange an appointment with your specialist or breast care nurse if necessary. Appointments to see a member of your treatment team may also be arranged during treatment so you can ask questions and discuss any concerns.

Breath hold technique

Deep inspiration breath hold (DIBH) can help protect the heart from being affected by radiotherapy given to the left side.

It involves taking a deep breath in and holding it for a short time. Your therapeutic radiographer will tell you how and when to hold your breath.

If you need to use breath hold you will be given simple coaching instructions and time to practise the technique. You can find video tutorials on how to prepare for using DIBH on the Respire website respire.org.uk

DIBH is done both at the treatment planning appointment (see page 8) and at each external beam radiotherapy (EBRT) appointment.

Not everyone having their left side treated will need or be able to use this method, and there are other ways to protect your heart that your specialist can talk to you about.

Breast boost

Your specialist may recommend a boost of radiotherapy to an area where invasive breast cancer was removed following radiotherapy to the whole breast.

The boost is given at the end of treatment, usually as four to eight extra sessions.

If you're having IMRT (see page 5), the boost can be given by planning the radiotherapy to deliver a higher dose to this area at the same time that the breast is being treated.

SIDE EFFECTS OF RADIOTHERAPY

Like any treatment, radiotherapy can cause side effects. Everyone reacts differently to treatment and some people have more side effects than others. These side effects can usually be managed and those described here will not affect everyone.

If you're worried about any side effects, regardless of whether they are listed here, talk to your treatment team.

Some side effects are temporary, but some may be permanent and some may appear months or years after treatment finishes.

If you are going to be taking hormone therapy, your specialist may suggest waiting until the radiotherapy is finished. This is so you don't have to manage side effects from two treatments at the same time.

Immediate side effects

Immediate side effects may also be called early or acute side effects. They occur during treatment and up to six months after treatment has finished.

Skin reactions

Most people have some redness around the area being treated.

The skin may also:

- Become pinker or darker over time
- Feel tender, dry, itchy and sore
- Peel or flake as treatment goes on
- Blister or become moist and weepy

You may hear the skin reaction being called radiation dermatitis.

Skin reactions may start during or after treatment. The skin reaction is normally at its worst between 7 and 14 days after treatment. After this it usually starts to get better.

Let your treatment team know if you develop a skin reaction. Most skin reactions are mild and should heal within three to four weeks of your last treatment, but some may need treating or monitoring more closely. For example, skin that has blistered or is peeling will take longer to heal.

The Society and College of Radiographers has information on their website on skin reactions and how to care for your skin. You can download a patient-friendly leaflet from sor.org/skincare

Caring for your skin during radiotherapy

It's important to look after your skin during treatment. This will help prevent infection, reduce pain and help keep the area being treated comfortable. You will be given skincare instructions by your radiotherapy team. The following tips may also help.

Washing the skin

Wash the treated area gently with warm water and pat the skin dry with a soft towel.

Skincare products

If you want to use anything on the skin in the treatment area, discuss this with your therapeutic radiographer first. You can continue to use moisturiser that is free of sodium lauryl sulphate, which can cause irritation, but it's not recommended to apply this immediately before your treatment. If your skin blisters or peels let the radiotherapy staff know.

You can continue to use soap and deodorant that suits your skin unless your treatment team has told you not to.

Heat and cold

Avoid exposing the treated area to very hot or cold temperature such as hot water bottles, heat pads, saunas or ice packs during treatment.

Taking care in the sun

Avoid exposing the treated area to the sun while having radiotherapy and until any skin reaction has settled down.

The skin in the treated area will remain sensitive to the sun for some time after treatment. Use a sunscreen with a high SPF. Apply the cream under clothes too as you can

Swimming

Skin changes from radiotherapy can be irritated by chlorine or chemicals in the pool. Speak to your treatment team if you want to go swimming during or shortly after treatment.

Clothing, bras and prostheses

Friction or rubbing from clothing can cause or worsen skin reactions.

You'll usually be advised not to wear an underwired bra until your skin heals. Wearing clothing made from natural fibres, such as a soft cotton bra or vest, may help. You may prefer to go without a bra.

If you've had a mastectomy and wear a silicone prosthesis, you may find it more comfortable to wear the soft, lightweight prosthesis (softie or cumfie) you used after surgery. You can find more about this in our booklet **Breast prostheses, bras and clothes after surgery**.

Swelling (oedema) of the breast

Your breast or chest area may appear swollen and feel uncomfortable. This usually settles within a few weeks after treatment. If it continues after this time, talk to your treatment team as you may need to be seen and assessed by a lymphoedema specialist (see page 18).

Pain in the breast or chest area

You may have aches, twinges or sharp pains in the breast or chest area. These are usually mild. They may continue for months or years, but they usually become milder and less frequent over time.

You may also have stiffness and discomfort around the shoulder and breast or chest area during and after treatment. Continuing to do arm and shoulder exercises during radiotherapy and for several months afterwards may help minimise or prevent any stiffness or discomfort. See our **Exercises after breast cancer surgery** leaflet for arm and shoulder exercises that can help with stiffness or discomfort.

You can find tips on managing pain after treatment in our **Moving Forward** book.

Hair loss

Radiotherapy to the armpit will make the underarm hair fall out on that side. You will also lose any hair on the area of the chest that's being treated.

Hair in the treatment area usually starts to fall out two to three weeks after treatment has started and it may take several months to grow back. For some people, hair lost from radiotherapy may never grow back.

Sore throat

If you have treatment to the area around your collarbone or near your breastbone, you may develop a sore throat or discomfort when swallowing. If this happens, talk to your treatment team.

It may help to take pain relief in liquid form, particularly before eating, until the discomfort improves.

Extreme tiredness

Fatigue is extreme tiredness and exhaustion that doesn't go away with rest or sleep. It can affect you physically and emotionally.

It's a very common side effect of radiotherapy and may last for weeks or months after your treatment has finished. If you have also had chemotherapy, you may already be experiencing fatigue by the time you start radiotherapy.

Occasionally fatigue is a long-term effect.

Fatigue can also be caused by conditions such as anaemia (too few red blood cells). It's important to let your treatment team know if you're affected by fatigue to rule out other conditions.

Fatigue affects people in different ways and there are a number of ways of coping with and managing it – your treatment team can help you with this.

Tips to help manage fatigue

- Keep a fatigue diary – recording your level of fatigue every day can help you identify causes and plan activities
- Plan your days so you have a balance of activity and rest
- Do small amounts of physical activity each day, even a short walk can help
- Accept that you may have good days and bad days
- Prepare for a special occasion by getting some rest beforehand
- Try to eat well – if your appetite is poor, it may help to eat smaller amounts more often and drink plenty of fluids to keep hydrated. You could also ask to be referred to a dietitian for advice
- Accept offers of help from other people to save your energy for things you enjoy

You can find more information on our website or by calling our Helpline on 0808 800 6000. Macmillan Cancer Support (macmillan.org.uk) produces a booklet called **Coping with fatigue**.

Lymphoedema

Lymphoedema is swelling of the arm, hand, breast or chest area caused by a build-up of fluid in the surface tissues of the body. It can occur as a result of damage to the lymphatic system, for example because of surgery or radiotherapy to the lymph nodes under the arm and surrounding area.

Lymphoedema can occur at any time after treatment, sometimes years later.

If the arm, hand, breast or chest area on the side where you had the radiotherapy or surgery swells or feels uncomfortable and heavy, contact your treatment team or GP.

Lymphoedema is a long-term condition, which means that once it has developed it can be controlled but is unlikely to ever go away completely.

For more information see our **Reducing the risk of lymphoedema** booklet. If you develop lymphoedema you may find it useful to read our **Living with lymphoedema after breast cancer** booklet.

Change in breast shape, size and colour

If you've had radiotherapy after breast-conserving surgery, the breast tissue and nipple on the treated side may feel firmer than before, change colour or the breast may be smaller and look different.

Although this is normal, you may be concerned about differences in the size of your breasts or worry that the difference is noticeable.

You can discuss this with your breast surgeon to see if anything can be done to make the difference less noticeable. You can also talk to your breast care nurse or call our Helpline on **0808 800 6000** to discuss how you feel about your new shape.

These side effects may affect how you feel about your body, including how you feel about intimacy and sex. You may find our booklet **Your body, intimacy and sex** helpful.

Tenderness over the ribs

Tenderness can occur over the ribs during treatment. In some people, this discomfort may continue but it usually improves gradually over time.

Late side effects

Some side effects can develop months or years after radiotherapy treatment ends. However, these side effects are much less common.

Serious side effects are very rare and the benefits of the treatment in reducing the chances of breast cancer returning outweigh the risk of possible side effects.

Hardening of the tissue

Hardening of the tissue (fibrosis) is rare but may happen several months or years after radiotherapy has finished. If the fibrosis is severe, the breast can become noticeably smaller and firmer.

Changes to the reconstructed breast

If you have a breast reconstruction using an implant, radiotherapy can cause the reconstructed breast to become firmer, change shape or become uncomfortable. You may hear this called capsular contracture.

If you have a breast reconstruction using your own tissue (tissue flap), radiotherapy can cause the tissue of the reconstruction to change shape or shrink.

If you notice changes to your reconstructed breast talk to your breast surgeon or breast care nurse.

Broken blood vessels

Under the skin you may see tiny broken blood vessels. This is known as telangiectasia. Although it's not harmful to you, it's permanent and there's no treatment for it. It may affect you emotionally and the way you see your body. If you are worried about this talk to your breast care nurse.

Changes to the lungs

Sometimes after treatment to the breast or chest wall area, part of the lung behind the treatment area can become inflamed. This may cause a dry cough or shortness of breath. It usually heals by itself over time. More rarely, hardening of the upper lung tissue can occur which can cause similar side effects.

Heart problems

There is a small risk of heart problems in the future from radiotherapy given on the left side. The risk is very low as care is taken to reduce the dose of radiotherapy to the tissues of the heart.

Risk of another cancer developing

There is a small risk of developing another cancer in the future from having radiotherapy. This is very rare, and much less of a risk than your breast cancer returning if you do not have radiotherapy. Your specialist will discuss this risk with you.

Other side effects

Other side effects include:

- Weakening of the bones in the treated area – can lead to rib and collarbone fractures
- Damage to the nerves in the arm on the treated side
 - may cause tingling, numbness, pain, weakness and possibly some loss of movement
- Long-term skin reactions (chronic radiation dermatitis)
 - see 'Skin reactions'

If you're concerned about late side effects, speak to your treatment team.

DRUGS AND SUPPLEMENTS

Tell your specialist about any medications you're taking or considering taking. This includes vitamin and mineral supplements, herbal remedies and any treatments that are bought over the counter.

The evidence isn't clear whether high-dose antioxidants (including vitamins A, C and E, co-enzyme Q10 and selenium) are harmful or helpful during your radiotherapy.

Because of this uncertainty, many specialists don't recommend that people take high-dose antioxidant supplements during radiotherapy.

TRANSPORT AND COSTS

Whether you drive or use public transport, travelling to and from your treatment or paying for parking can be expensive, but help may be available.

If you travel by car, you may be able to have a special hospital pass which means you won't pay parking fees while having your radiotherapy.

If you claim benefits or are on a low income, you may be entitled to help with petrol costs, bus or train fares. There may be a hospital transport service, community transport services in your area or organisations with volunteer drivers who give people lifts to and from hospital.

If you think going to appointments will be difficult because of the cost or other travel issues, talk to your radiographer or breast care nurse to find out what help is available. If you have a local cancer information centre, they can tell you if any financial help or voluntary community transport is available in your area.

Macmillan Cancer Support produces a booklet called Help with the cost of cancer, which outlines what you may be entitled to. You can also find out about help with health costs on the NHS website nhs.uk

FINISHING TREATMENT

Once you've finished treatment it may take some time to get back to your everyday routine. Try not to expect too much of yourself in the early days and weeks after your treatment and give yourself time to heal and regain your strength. You may continue to feel tired for some time and tiredness can get worse after radiotherapy finishes but gradually you'll start to feel better. For some people, this may take several months and sometimes longer.

For many people, radiotherapy is the last hospital-based treatment and the end goal they focus on, and getting there can feel like real progress. But some people also feel isolated, low and fearful, especially when their regular hospital appointments stop. You can talk to your breast care nurse about how you feel, and they can direct you towards support.

There are support services available to help you, see page 23 for more information.

Follow-up

At the end of your hospital-based treatment, you may continue to be monitored to check how you are recovering. This is known as follow-up. How you are followed up will depend on your individual needs and on the arrangements at the hospital you have been treated in.

Whichever way you are followed up you will be given a name and contact number to ring (usually the breast care nurse) if you have any questions or concerns between appointments. You can always talk to your GP about any concerns you have.

For more information about follow-up, see our booklet

After breast cancer treatment: what now?

FURTHER SUPPORT

Breast Cancer Now has a number of services to help support you.

Helpline

Our specialist team are ready to listen on our free Helpline. Call **0808 800 6000** (Monday to Friday 9am–4pm and Saturday 9am–1pm). You can also email nurse@breastcancernow.org

Forum

Through our online Forum, we're with you every step of the way – alongside thousands of people with real experience of breast cancer. Look around, share, ask a question or support others at breastcancernow.org/forum

Someone Like Me

You never have to face breast cancer alone. Find somebody who understands what you're going through with Someone Like Me. Call our Someone Like Me service on **0114 263 6490**.

Moving Forward course

Moving Forward gives you the tools to help you adjust to life beyond primary breast cancer treatment. Find out more at breastcancernow.org/movingforward

Becca, the breast cancer support app

With Becca, the breast cancer support app, we're with you even when your treatment has finished. Find out more at breastcancernow.org/becca

HELP US TO HELP OTHERS

Breast Cancer Now is a charity that relies on voluntary donations and gifts in wills. If you have found this information helpful, please visit breastcancernow.org/give to support our vital care and research work.

ABOUT THIS BOOKLET

Radiotherapy for primary breast cancer was written by Breast Cancer Now's clinical specialists, and reviewed by healthcare professionals and people affected by breast cancer.



For a full list of the sources we used to research it:
Email health-info@breastcancernow.org



You can order or download more copies from
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We welcome your feedback on this publication:
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BREAST CANCER NOW

The research & support charity

At Breast Cancer Now we're powered by our life-changing care. Our breast care nurses, expertly trained staff and volunteers, and award-winning information make sure anyone diagnosed with breast cancer can get the support they need to help them to live well with the physical and emotional impact of the disease.

We're here for anyone affected by breast cancer. And we always will be.

For breast cancer care, support and information, call us free on **0808 800 6000** or visit **breastcancernow.org**

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Patient Information Forum

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