PARP inhibitors in breast cancer treatment

1. What are PARP inhibitors?

PARP inhibitors are a type of targeted (biological) therapy. The most widely used PARP inhibitor is currently olaparib (Lynparza).

Other PARP inhibitors include:
- Talazoparib (Talzenna)
- Rucaparib (Rubraca)
- Veliparib
- Niraparib

2. Who may be offered PARP inhibitors?

Primary breast cancer

PARP inhibitors may be used in the treatment of primary breast cancer that is:
- Hormone receptor positive, HER2 negative with an altered BRCA gene
- Triple negative with an altered BRCA gene
Secondary breast cancer

PARP inhibitors can be given to people with HER2 negative, secondary breast cancer with an altered BRCA gene.

Availability

PARP inhibitors are not currently available on the NHS.

If you have primary breast cancer that is hormone receptor positive, HER2 negative with an altered BRCA gene you may be able to access olaparib through an early access scheme run by the drug company.

If you have secondary breast cancer that is HER2 negative with an altered BRCA gene you may be able to access olaparib through a compassionate access scheme run by the drug company.

Speak with your treatment team to see if you’re able to access this treatment.

3. How PARP inhibitors work

Targeted (biological) therapies block the growth and spread of cancer.

PARP stands for poly-ADP ribose polymerase. It's a protein that helps cells repair themselves if they become damaged. PARP inhibitors stop the PARP from repairing cancer cells.

Two inherited altered genes that increase the risk of breast cancer developing are called BRCA1 and BRCA2. Cancer cells with faulty BRCA genes are less able to repair themselves if they become damaged. PARP inhibitors can also help block the cancer cells from repairing themselves and cause them to become too damaged to survive.

4. How PARP inhibitors are given

Clinical trials have shown that PARP inhibitors can be given on their own or alongside hormone (endocrine) therapy. Research is looking into giving PARP inhibitors alongside chemotherapy or other targeted (biological) therapies.

They’re given as tablets or capsules taken once or twice a day depending on which drug you’re having.

5. Side effects of PARP inhibitors
Like any treatment PARP inhibitors can cause side effects. You may experience different side effects depending on the specific PARP inhibitor you have.

Everyone reacts differently to drugs and some people have more side effects than others. These side effects can usually be managed and those described here will not affect everyone.

This information does not list all the possible side effects. If you have any questions about side effects, whether they are listed below or not, talk to your treatment team.

Because PARP inhibitors may be given alongside other drugs, you may also experience side effects from these. It’s sometimes difficult to know which drug causes which side effect.

You should be given a 24-hour contact number or told who to contact if you feel unwell or are concerned about side effects at any time, including at night or at the weekend.

**Common side effects of PARP inhibitors**

**Effects on the blood**

PARP inhibitors can temporarily affect the number of blood cells in the body.

You’ll have regular blood tests to check your blood count. Blood is made up of red cells, white cells and platelets. If the number of blood cells is too low, your next treatment may be delayed or the dose reduced.

**Anaemia**

Having too few red blood cells is called anaemia. If you feel particularly tired, breathless or dizzy, let your treatment team know.

**Risk of infection**

Not having enough white blood cells (neutropenia) can increase the risk of getting an infection such as a urine infection, pneumonia and bronchitis.

Your treatment team may give you guidelines to follow for reporting signs of an infection, but generally you should contact your hospital immediately if you experience any of the following:

- A high temperature (over 37.5°C) or low temperature (under 36°C), or whatever your chemotherapy team has advised
• Suddenly feeling unwell, even with a normal temperature
• Symptoms of an infection, for example a sore throat, a cough, a need to pass urine frequently or feeling cold or shivery

Before you start PARP inhibitors your treatment team should give you a 24-hour contact number or tell you where to get emergency care.

**Bruising and bleeding**

PARP inhibitors can reduce the number of platelets, which help the blood to clot. You may bruise more easily, have nosebleeds or your gums may bleed when brushing your teeth. Tell your treatment team if you have any of these symptoms.

**Nausea and vomiting**

You may feel sick (nausea) and be sick (vomit) at times during your treatment.

If nausea and vomiting affect you, let someone in your treatment team know. Anti-sickness drugs can be prescribed to help.

Try to eat small regular meals if possible and have regular drinks.

**Extreme tiredness**

Fatigue is extreme tiredness that doesn’t go away with rest or sleep. It’s a very common side effect of breast cancer treatment, including PARP inhibitors, and may affect you physically and emotionally.

Fatigue may affect your ability to drive or operate machinery. If you think you have fatigue, tell your GP or treatment team. They can assess you and offer advice on how to manage your energy levels.

[Find out more about managing fatigue.](#)

**Dizziness**

PARP inhibitors may cause dizziness. If you feel dizzy, avoid driving. If dizziness persists speak to your treatment team or GP.

**Diarrhoea**

This is usually mild. If you have diarrhoea, drink plenty of fluids. Your treatment team or GP can prescribe drugs to help.
Contact your treatment team if you have four or more episodes of diarrhoea within a 24-hour period.

**Other common side effects**

Other common side effects of PARP inhibitors include:

- Headaches
- Cough or shortness of breath
- Loss of appetite
- Change in how things taste
- Heartburn or indigestion

**Less common side effects of PARP inhibitors**

**Liver and kidney changes**

PARP inhibitors can affect how the liver and kidneys work. Your treatment team will arrange regular blood tests while you're having treatment to check for this.

**Hair loss**

The PARP inhibitor talazoparib may cause hair loss or thinning.

Any hair loss caused is usually temporary and in most cases your hair will begin to grow back once your treatment has ended.

[Find out more about breast cancer and hair loss.](#)

**Other less common side effects**

Other less common side effects of PARP inhibitors include:

- Stomach pain
- Skin rashes
- Sore mouth

6. **Other important information**

**Allergic reaction**
Very occasionally allergic reactions to a drug can occur. Reactions can vary from mild to severe, although severe reactions are uncommon.

If you have an allergic reaction to PARP inhibitors, it’s more likely to happen the first time you have the treatment.

Symptoms include:

- Flushing
- Skin rash
- Itching
- Back pain
- Shortness of breath
- Feeling faint
- Fever or chills

If you experience any of these symptoms, let your treatment team know immediately.

**Food and medicines to avoid when having PARP inhibitors**

The most widely used PARP inhibitor is olaparib. It’s recommended that anyone on olaparib avoids grapefruit juice and bitter (Seville) oranges as these can affect how the drug works.

A number of drugs should not be taken with PARP inhibitors, so it’s important to tell your treatment team about any prescribed or over-the-counter medicines you are taking.

Many people consider taking herbal medicines or supplements while having treatment for breast cancer. Some PARP inhibitors must not be taken with anything containing St John’s wort.

Speak to your treatment team about any food, medicines or herbal supplements you may need to avoid.

**Contraception and pregnancy**

You’re advised not to become pregnant while having treatment because PARP inhibitors can harm a developing baby. You may be asked to do a pregnancy test before starting treatment and during your treatment.

If you haven’t been through the menopause, talk to your team about the most suitable method of contraception for you. It’s still possible to become pregnant even if your periods become irregular or stop.
Women should use an effective barrier method of contraception such as condoms during treatment and for a period of time after the last dose.

Men taking PARP inhibitors who have a sexual partner who can become pregnant should use a reliable method of contraception while taking PARP inhibitors and for a period of time after.

Check with your treatment team how long you should continue using a barrier method of contraception after your treatment has finished.

**Fertility**

The impact of PARP inhibitors on fertility is not currently known. It's important to discuss any fertility concerns with your treatment team before you begin your treatment.

**Breastfeeding**

Breastfeeding is not recommended while having PARP inhibitors and for a period of time after the last dose. This is because there’s a risk the drugs can be passed on through breast milk.

**Travel and vaccinations**

If you’re planning a holiday or need to travel overseas, check with your treatment team first.

You shouldn’t have any live vaccines while you’re having treatment. Live vaccines include mumps, measles, rubella (German measles), polio, BCG (tuberculosis), shingles and yellow fever.

Live vaccines contain a small amount of live virus or bacteria. If you have a weakened immune system, which you may do during treatment, they could be harmful.

It’s safe to have these vaccinations six months after your treatment finishes. Talk to your GP or treatment team before having any vaccinations.

If anyone you have close contact with needs to have a live vaccine speak to your treatment team or GP. They can advise what precautions you may need to take depending on the vaccination.

**Flu vaccination**
Anyone at risk of a weakened immune system, and therefore more prone to infection, should have the flu vaccine. This includes people due to have, or already having, chemotherapy.

The flu vaccine is not a live vaccine so doesn’t contain any active viruses. Talk to your chemotherapy team or breast care nurse about the best time to have your flu jab.

**Coronavirus (Covid-19) vaccination**

People having PARP inhibitors are advised to speak to their treatment team about the best time to have a coronavirus (Covid-19) vaccination.

The Covid-19 vaccines are not live vaccines.

Find out more about coronavirus vaccines.

**7. Further support**

If you’d like any further information on PARP inhibitors or just want to talk things through, our specialist team are ready to listen on our free [Helpline](#).

Last reviewed: July 2022

Next planned review begins 2024