MEDICINE INFORMATION

R-ICE (rituximab, ifosfamide, carboplatin and etoposide)

A guide to R-ICE for some B-cell lymphomas, including the multi-day treatment, bladder protection and checks during recovery.

At a glance

Treatment	Rituximab + Ifosfamide + Carboplatin + Etoposide
When it may be used	For selected people with B-cell lymphoma that has returned or has not responded adequately to previous treatment.
How it is given	Rituximab, ifosfamide, carboplatin and etoposide are given through a vein.
Before you start	Confirm the treatment dates, whether you need to stay in hospital and how to get help between visits.

What this treatment is and how it works

Rituximab is an antibody that attaches to a protein called CD20 on certain B cells. It helps the immune system remove cells carrying that protein. Ifosfamide, carboplatin and etoposide are chemotherapy medicines that interfere with the growth of lymphoma cells. The letters ICE come from their names.

When it may be used

R-ICE can be used in selected people with B-cell non-Hodgkin lymphoma that has returned or continued to grow after earlier treatment. The team considers your biopsy, previous treatments, kidney function and general health. In some treatment plans, R-ICE helps bring the lymphoma under control before high-dose treatment and a transplant using your own stem cells. Ask how the team will decide the next step.

Before treatment

Tell your team about previous infusion reactions, heart or kidney conditions, trouble passing urine, hearing changes and any medicines or supplements you take. Mention any past hepatitis B infection. Rituximab can reactivate the virus, so you usually have a blood test and may need preventive medicine or follow-up.

You usually have blood counts and checks of your kidneys, liver and blood salts. Ask if you need a central line, which stays in a large vein, and whether you should plan for an overnight stay. Tell the team if you want to discuss fertility preservation.

How treatment is given

You receive the drugs over several days. Some centres give ifosfamide as a long infusion and others divide it into shorter visits. Your calendar will show which medicines you get each day. The team usually gives medicines to prevent nausea and to reduce the risk of a reaction to rituximab. Tell your nurse right away if you feel itchy, dizzy, shivery or breathless during a drip.

Mesna and fluids help protect the bladder from ifosfamide. You may receive mesna through a drip, as tablets, or both. If you need tablets after you go home, check the exact times before leaving. Call the unit if you miss a dose or vomit after taking it. The team may also prescribe injections that help your white blood cells recover.

Tests and monitoring during treatment

Staff may check your urine for blood and monitor how much you pass. They also check your blood counts, kidneys and blood salts. While you receive ifosfamide and afterwards, tell staff if you feel unusually sleepy, confused or unsteady. A caregiver may notice a change before you do. Report it straight away so the team can assess whether ifosfamide is affecting your brain.

Keep your blood test appointments even if you feel well. Ask when you will have a scan or discuss collecting stem cells, if that is part of your plan.

Side effects

Common side effects

- **Low blood counts.** You are more likely to have infections, tiredness or bleeding. Report new bruising, fever or shaking chills promptly.
- **Nausea, poor appetite and bowel changes.** Follow your prescribed anti-sickness plan and tell the team if you cannot drink normally.
- **Sore mouth and taste changes.** Ask for mouth care and help if eating or swallowing becomes difficult.
- **Tiredness and hair loss.** Pace everyday activities and ask about practical help, particularly between visits.

Less common and serious side effects

Ifosfamide can irritate the bladder and affect the kidneys. Tell the team about red or bloody urine, pain when passing urine or passing much less than usual. Ifosfamide can also cause confusion, marked drowsiness or a seizure. Report these changes immediately.

Rituximab and other infusions can cause allergic reactions. Staff will check you during the infusions. Call for advice if symptoms start after you leave. If the drip site stings, hurts or swells, tell the nurse immediately.

When to seek urgent help

In hospital, tell your nurse straight away about fever, shaking chills, blood in your urine, unexpected bleeding or any new change in alertness. At home, call the hospital's 24-hour cancer care number for these symptoms, repeated vomiting, difficulty drinking or sudden illness. Follow your hospital's temperature instructions. If you have no written threshold, call at 37.5°C (99.5°F) or above, or below 36°C (96.8°F). Call if you feel very unwell even with a normal temperature.

Seek emergency care for a seizure, difficulty waking, severe confusion, severe breathing difficulty, chest pain, collapse or bleeding that will not stop. Tell staff you have had ifosfamide as part of R-ICE.

Practical advice for this treatment

Ask how the cycle will be organised

R-ICE can involve long visits or a hospital stay. Check how rituximab and chemotherapy are scheduled and whether you will need injections or blood tests after discharge. If a stem cell collection is possible, ask when you will meet the transplant team and how collection is timed.

Follow bladder protection instructions

Ifosfamide can irritate the bladder. Mesna and fluids help protect it. Ask whether any doses continue outside hospital and call if you miss or vomit one. Tell staff about urinary pain, blood or a marked fall in urine output.

Ask someone to watch for changes after ifosfamide

Unusual drowsiness or confusion can occur. A caregiver can help by reporting what is different and when it started. Seek emergency care for a seizure or difficulty waking. Ask your team before taking sedating medicines.

Medicines, interactions and vaccinations

Ask the team to check any new medicines, including sleeping tablets, painkillers, supplements and vaccines. Ask when to take any infection-prevention medicines and what to do if you miss them. Your team can tell you when vaccination is appropriate after rituximab.

Everyday life

If treatment is given over several visits, bring your calendar and a list of medicines to each visit. Plan transport and someone to call if you feel unwell. Drink as advised, and check what to do if you have a fluid restriction or cannot keep up with drinking.

Pregnancy, fertility and breastfeeding

Discuss fertility, contraception and breastfeeding before starting. Ask how long precautions continue after the final cycle or after a transplant if one is planned.

After treatment

Keep your next blood test and scan appointments. Ask when you can return to usual activities and when your team will review next steps. Let them know if bladder, hearing or nerve symptoms persist.

Frequently asked questions

Will I be admitted for every cycle?

This depends on the schedule and your health. Some plans include an admission and others use day unit visits.

Why do I need mesna?

It helps protect your bladder from an irritating breakdown product of ifosfamide.

What if I miss a mesna tablet?

Call your treatment unit straight away if you miss or vomit a dose. Mesna protects the bladder after ifosfamide, and the unit may need to arrange another dose or a different way to give it. Follow the timetable supplied by your unit.

Does urine need to be checked if it looks normal?

Yes. A test may detect small amounts of blood before you can see them.

Why is my family asked to look out for confusion?

Ifosfamide can affect alertness and thinking. Someone with you may notice the change first. Call promptly if that happens.

Will I need a white-cell injection?

Some people do. Ask which medicine you have been prescribed and on which days to take it.

Why do I have a hepatitis B test?

Rituximab can reactivate a previous infection. The test helps the team decide which precautions to take.

Can I go home with a pump?

Some units offer this in selected circumstances. Ask the unit how to look after it and who to call if it alarms or leaks.

Will I need a stem cell transplant after this?

It depends on the plan, the response and your health. Your doctor will explain how the next step is decided.

What if I get chills during rituximab?

Tell your nurse immediately. Staff can assess the reaction and decide whether to pause the infusion.

Can I drive home after treatment?

Check with the unit first. Pre-treatment medicines or side effects may make it unsafe to drive.

Why was the next cycle moved?

Blood counts, infections, kidney tests or other symptoms may need time to recover or further assessment.

Is it safe to take pain medicines at home?

Ask your team which are suitable, especially if you have low platelets or a kidney problem.

What if I feel well but my blood counts are low?

Follow your hospital's advice and keep the blood tests. Counts can be low before you notice any symptoms.

Individual medicine guides

- Rituximab
- Ifosfamide
- Carboplatin
- Etoposide

Sources and further reading

Read this guide alongside your hospital's plan. Ask your pharmacist to confirm the exact product dispensed in India and follow the instructions for that product.

Summary of Product Characteristics (SmPC) and prescribing information

- Rituximab (MabThera) - EU SmPC
- Ifosfamide injection - UK SmPC
- Carboplatin infusion - UK SmPC
- Etoposide infusion - Irish HPRA SmPC
- Mesna injection - UK SmPC
- Mesna tablets - UK SmPC
- Etoposide injection US prescribing information

Clinical protocols and other references

- eviQ rituximab and infusional ICE protocol

Additional sources

- Macmillan Cancer Support, R-ICE
- eviQ, R-ICE with infusional ifosfamide
- Macmillan Cancer Support, mesna

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