
Antibody Drug Conjugates - OriGene University - YouTube

The **ICE regimen** is a chemotherapy combination used mainly for **relapsed or refractory Hodgkin and non-Hodgkin lymphoma**. ICE stands for the three drugs it includes:

- **Ifosfamide** (alkylating agent)
- **Carboplatin** (platinum-based alkylating agent)
- **Etoposide** (topoisomerase II inhibitor)

Often, especially for **CD20-positive B-cell lymphomas**, a monoclonal antibody called **rituximab** is added, making the regimen **R-ICE** or **ICE-R**.

# Treatment Schedule and Administration

- ICE is typically given in **cycles lasting about 21 days**, with treatment over the first 3 days and then a rest period.
- A common schedule includes:
    - **Day 1:** Etoposide infusion (about 1 hour).

    - **Day 2:** Etoposide infusion (1 hour), carboplatin infusion (30 to 60 minutes), and **ifosfamide plus mesna** given by continuous infusion over 24 hours.

    - **Day 3:** Etoposide infusion (1 hour) plus mesna infusion (8 to 12 hours) or mesna tablets to protect the bladder.

- Patients have around **18 days off chemotherapy** before the next cycle starts.

- Usually, patients receive **3 to 6 cycles**, depending on treatment response and eligibility for stem cell transplantation.

## Supportive Medications

- **Mesna** is given alongside ifosfamide to prevent **hemorrhagic cystitis** (bladder toxicity).

- **Granulocyte colony-stimulating factor (G-CSF)** is often administered after chemotherapy to reduce the duration of neutropenia and infection risk.

## Common Side Effects and Risks

- **Hematologic toxicities:** Severe neutropenia, thrombocytopenia.

- **Neurotoxicity:** Ifosfamide can cause encephalopathy (confusion, delirium).

- **Kidney and bladder toxicity:** Monitored carefully and prevented with mesna and hydration.

- Other risks include nausea, vomiting, hair loss, fatigue, and risk of infections due to bone marrow suppression.

## Clinical Use and Role

- ICE is commonly used as a **salvage therapy** for lymphoma that is refractory or has relapsed after initial treatment.

- It is often used as a **bridge to autologous stem cell transplant** for eligible patients.

- The combination targets rapidly dividing lymphoma cells through complementary mechanisms: alkylation of DNA, inhibition of topoisomerase II, and platinum-induced

DNA cross-linking.

## Summary Table of ICE Components

| Drug | Class | Primary Action | Administration |
|---|---|---|---|
| Ifosfamide | Alkylating agent | DNA cross-linking, apoptosis | IV continuous infusion over 24 hours (day 2) with mesna |
| Carboplatin | Platinum compound | DNA cross-linking, replication block | IV infusion (day 2) |
| Etoposide | Topoisomerase II inhibitor | Stabilizes DNA breaks causing apoptosis | IV infusion 1 hour (days 1–3) |
| Mesna | Uroprotectant (not chemo) | Protects bladder from ifosfamide toxicity | IV infusion or oral (days 2–3) |

In conclusion, the ICE regimen is a multi-agent chemotherapy protocol combining ifosfamide, carboplatin, and etoposide, administered over 3 days in cycles usually repeated every 21 days, used primarily in lymphoma patients whose disease has relapsed or is refractory, often preceding stem cell transplant.


1. https://www.youtube.com/watch?v=6gzW9InoIaU
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