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Plerixafor

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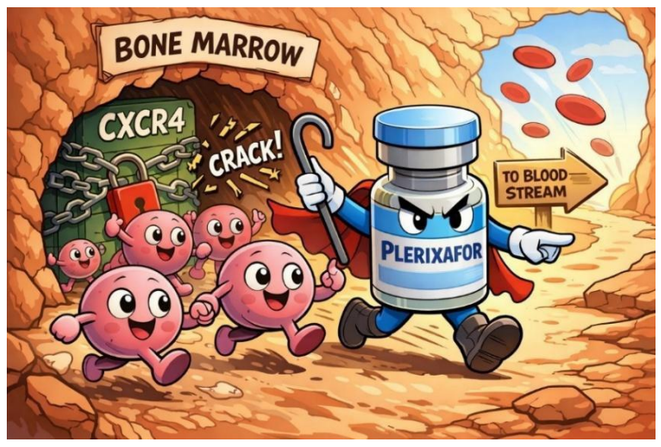

About Plerixafor

For years, collecting enough stem cells for a transplant was a race against time, and many patients struggled to cross the finish line. Originally created as a drug to fight HIV, plerixafor failed at its first job but revealed a surprising "side effect": it acted like a key that unlocked the bone marrow. By releasing a massive wave of stem cells into the bloodstream in just hours, this discovery has become a lifesaver for patients who previously couldn't produce enough cells for their own treatment.

Pharmacological class

CXCR4 receptor blocker
Hematopoietic stem cell mobilizer

How Plerixafor works (Mechanism of action)

1. Target action

✓ Plerixafor blocks the CXCR4 receptor found on hematopoietic stem cells.
✓ Normally, this receptor binds to a chemical signal called CXCL12, which is produced in the bone marrow.
✓ This binding keeps the stem cells attached inside the bone marrow, acting like a “magnet” that holds them in place.
✓ Plerixafor blocks this attachment signal.

2. Stem cell mobilization

When CXCR4 is blocked

✓ Stem cells (CD34+ cells) detach from the bone marrow
✓ They move into the bloodstream
✓ Unlike Filgrastim, which increases stem cell production over several days, Plerixafor directly breaks the attachment.
✓ The number of circulating stem cells usually increases within 10 – 14 hours after injection.

Clinical Use

This drug is mainly used for patients who need autologous stem cell transplantation. By increasing stem cells in the blood:

✓ Enough stem cells can be collected through apheresis
✓ It is especially helpful in patients who find it difficult to mobilize the stem cell.

FDA approved indication

Plerixafor is used together with G-CSF (Filgrastim) to mobilize stem cells for collection in non-Hodgkin lymphoma & Multiple myeloma

Why is it combined with Filgrastim?

✓ **Filgrastim** acts as the factory foreman, stimulating the bone marrow to produce a surplus of stem cells and gradually pushing them toward the exit.
✓ **Plerixafor** acts as the master key, instantly unhooking those stem cells from the marrow so they can flood into the bloodstream for quick collection**.**
✓ **Together, this duo** ensures a higher stem cell count and a faster, more reliable collection, drastically reducing the risk of failure for patients who need a stem cell transplant.

Dose and Administration

Dose: 0.24 mg/kg OD for 4 consecutive days. Max dose 40 mg/day

Renal dose adjustment: CrCl 50 mL/min or less in patient weighing 83 kg or less: 13mg or 0.16mg/kg OD

CrCl 50 mL/min or less in patient weighing greater than 83 kg and less than 160 kg: 0.16mg/kg OD. Max: 27mg/day

Route: Subcutaneous injection; Time: Given 10–14 hours before apheresis.