

Chemotherapy Safety and Extravasation

A plain-English guide for you and your family

WHAT IS HAPPENING

Chemotherapy is powerful medicine that kills fast-growing cells, which is why it fights cancer. The drugs travel through an IV line placed in a vein so they can spread safely through your bloodstream. But if the IV slips out of the vein or tears, the chemo leaks into the tissue around it instead. Some chemo drugs — like doxorubicin (a red drug called an anthracycline), vincristine (a drug called a vinca alkaloid), and mitomycin — are so strong they kill skin and muscle cells on contact, just like they kill cancer cells. This is called extravasation, which means 'leaking outside the vessel.' The first signs are burning pain, swelling, and redness right at the IV spot. If the leak is not caught fast, the tissue keeps dying over hours or days, forming a wound that may need surgery to remove the dead tissue and cover the area with a skin graft. This is why nurses check your IV site constantly during chemo — catching a leak in the first few minutes can save your skin and muscle. If you ever feel burning or notice swelling at your IV, speak up immediately. Time matters.

What you might feel

- Swelling at the IV site
- Pain or burning at the IV site
- Redness around the IV site
- Skin feels tight or stretched
- The IV drip slows down or stops
- No blood return when the IV is checked
- Skin blanching (turning white or pale)
- Blistering or skin breakdown (delayed, hours to days later)

Call the doctor right away if...

- Swelling, pain, or burning at the IV site during or right after chemotherapy
- Skin turns pale, blanched, or develops blisters near the IV

- No blood flows back when the IV line is checked
- The IV pump alarm goes off or the drip suddenly slows or stops

What the care team will do

- Stop the IV infusion immediately the moment extravasation is suspected, but leave the IV needle in place
- Aspirate 3 to 5 milliliters of fluid back through the IV needle using a small syringe before removing the needle
- Photograph the extravasation site and mark the borders of swelling or redness with a pen, then measure the area in centimeters
- For anthracycline drugs like doxorubicin, notify the physician immediately to order dexrazoxane (an antidote) IV within 6 hours and apply cold packs for 15 to 20 minutes four times daily
- For vinca alkaloid drugs like vincristine or taxane drugs like paclitaxel, inject hyaluronidase (an enzyme) into the extravasation area and apply warm packs for 15 to 20 minutes four times daily
- Elevate the affected arm above heart level on pillows
- Do not start another IV in the same arm, and document the exact drug name, volume extravasated, needle size, location, and all interventions in the medical record
- Teach the patient to watch for increasing pain, blistering, skin breakdown, or fever and to call the oncology team immediately if any of these develop in the next 2 weeks

Medicines you may be given — and why

Dexrazoxane

Dexrazoxane grabs iron particles (tiny metal pieces) out of anthracycline molecules. Anthracyclines (like doxorubicin, the 'red devil' chemo) create damaging oxygen fragments called free radicals—like sparks flying off a grinding wheel—but only when iron is attached. When dexrazoxane removes the iron, the drug cannot make those sparks, so tissue damage stops spreading.

Hyaluronidase

Hyaluronidase is an enzyme (a protein that speeds up chemical reactions) that breaks apart hyaluronic acid, a thick gel-like substance that holds cells together in tissue. When chemo leaks into skin, it gets trapped in that gel. Hyaluronidase dissolves the gel, creating temporary channels so the leaked drug can spread out and drain away through lymph vessels (tiny drainage tubes in tissue) instead of sitting in one spot and killing a big patch of skin.

Topical cooling (cold packs)

Cold narrows blood vessels (vasoconstriction—like turning down a faucet) and slows down cell metabolism (the speed at which cells work and use energy). When anthracycline or an alkylating agent (like mechlorethamine) leaks into tissue, cells pick up the drug faster if they are warm and active. Cooling the area makes cells sluggish and closes off small blood vessels, so less drug enters cells and less damage happens.

Topical warming (warm packs)

Warmth opens (dilates) blood vessels and speeds up cell metabolism, increasing blood flow and lymphatic drainage (the flow of fluid through tiny drain channels in tissue). For drugs like vinca alkaloids and taxanes that bind tightly to cells and stay put, warmth helps the body flush the drug away faster, reducing the total dose any one patch of tissue sees.

Dimethyl sulfoxide (DMSO) topical

DMSO is a liquid that soaks through skin and grabs free radicals (harmful oxygen sparks created by anthracyclines) before they can damage tissue. It also reduces inflammation (swelling and immune-cell attack) at the leak site. By mopping up free radicals and calming the immune response, DMSO lowers the chance of deep ulcers and tissue death.

Where this information comes from

- Oncology Nursing Society (ONS) Chemotherapy and Immunotherapy Guidelines
- American Society of Clinical Oncology (ASCO)
- National Comprehensive Cancer Network (NCCN)
- European Oncology Nursing Society (EONS) Extravasation Guidelines

Last reviewed: 2026-07-07