MEDICINE INFORMATION

Tretinoin and arsenic trioxide (ATRA and ATO)

A patient guide to this treatment for acute promyelocytic leukaemia, including the first weeks of care, the later treatment cycles and the tests that keep treatment safe.

At a glance

Treatment	Tretinoin (ATRA) + Arsenic trioxide (ATO)
When it may be used	For selected people with acute promyelocytic leukaemia, a type of acute myeloid leukaemia.
How it is given	You take tretinoin capsules by mouth. Arsenic trioxide is given by drip into a vein.
Before you start	Ask about the treatment calendar, blood tests and heart checks. Know how to get help quickly for new breathlessness, fever or bleeding.

What this treatment is and how it works

Acute promyelocytic leukaemia (APL) develops when certain immature blood cells fail to develop normally. Tretinoin, also called all-trans retinoic acid (ATRA), is a medicine related to vitamin A. Arsenic trioxide (ATO) is a carefully measured prescription medicine. The two drugs help abnormal cells mature or die, allowing healthy blood cells to recover.

When it may be used

ATRA and ATO are used together for many people with newly diagnosed APL whose leukaemia falls in the low- or intermediate-risk group in the published protocol. The team uses the white cell count and other findings to choose the plan. Some people also need other medicines, particularly if the white cell count is high. The two medicines can be used in other APL settings under specialist care.

APL can cause serious bleeding early in the illness. Your team may start tretinoin as soon as APL is strongly suspected while it confirms the diagnosis. Ask which phase you are in and which medicines are planned for you.

Before treatment

Tell the team about a heart rhythm problem, fainting episodes, kidney or liver problems and all medicines and supplements. The team usually checks your blood counts, clotting, kidneys, liver and blood salts, including potassium and magnesium. You will have an electrocardiogram (ECG), a test that records the heart’s electrical activity.

Tell the team straight away if you are pregnant or could be pregnant. Tretinoin and arsenic trioxide can harm a developing baby. Your team will discuss pregnancy testing and precautions before treatment.

How treatment is given

The first phase, called induction, aims to clear signs of leukaemia. This phase is often started in hospital because the team needs to monitor bleeding risk, blood counts and side effects closely. You take tretinoin capsules and receive arsenic trioxide by drip on the days specified. The hospital may give platelets, other blood products or additional medicines as needed.

After a response, consolidation treatment helps lower the chance that the leukaemia will return. It includes treatment days and planned breaks. Some or all visits may be in the day unit. Ask for a calendar showing when to take capsules, when to attend for infusions and blood tests, and when to stop each medicine. Follow your own prescription if the calendar changes.

Tests and monitoring during treatment

The team checks blood counts and clotting closely, especially early on. Blood tests also track liver function and blood salts. Arsenic trioxide can change the heart's electrical timing, sometimes called QT prolongation. An ECG can identify this before symptoms occur. The team may replace potassium or magnesium or pause treatment if results change.

Your team may use a bone marrow sample and a sensitive test for the leukaemia's genetic marker to check the response. Ask when results are expected and what they mean for the next phase.

Side effects

Common side effects

- **Dry lips, skin and mouth.** A plain lip balm or moisturiser can help. Report painful cracks or trouble swallowing.
- **Headache, aches or tiredness.** Ask what pain relief is suitable. A severe or persistent headache needs assessment, particularly with vomiting or vision changes.
- **Nausea and bowel changes.** Take anti-sickness medicines as prescribed and tell the team if you cannot drink normally.
- **Changes in liver tests or blood salts.** These can occur even if you feel well. Keep your blood tests and follow the team's instructions about supplements.
- **Tingling or numbness.** Tell the team about new symptoms in your hands or feet, especially if they affect walking or daily activities.

Important side effects

Differentiation syndrome is a reaction that can occur as leukaemia cells respond to treatment. It can cause fever, new breathlessness, rapid weight gain, swelling, dizziness or passing less urine. Tell staff immediately or call the hospital if you are at home. Early assessment and treatment are important.

Arsenic trioxide can affect the heart rhythm. New palpitations, faintness or fainting need urgent assessment. A severe headache with blurred vision or vomiting can also be a sign of a serious side effect of tretinoin. In the first weeks, also report unusual bruising, nosebleeds or bleeding gums immediately.

When to seek urgent help

Tell staff immediately if you are in hospital. At home, call the hospital's 24-hour number for fever, shaking chills, new breathlessness, rapid weight gain, new swelling, worsening headache, unusual bruising or bleeding, 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 severe breathing difficulty, chest pain, fainting, a seizure, sudden weakness or trouble speaking, or bleeding that will not stop. Tell staff you have APL and are receiving tretinoin and arsenic trioxide.

Practical advice for this treatment

Know the signs of differentiation syndrome

This serious reaction can occur as leukaemia cells change and mature during treatment. Fever, new breathing difficulty, sudden weight gain, swelling or reduced urine need urgent assessment. Tell the clinical team you are having tretinoin and arsenic trioxide so it can consider early treatment.

Plan for heart and blood salt checks

Your team may check an electrocardiogram (ECG), which records your heart's electrical activity, as well as potassium and magnesium in your blood. Ask when those tests are due and who should check any new prescription, particularly if it can affect heart rhythm. Tell staff immediately if you faint, have palpitations or become very dizzy.

Keep urgent instructions with your capsules

Write down what to do if you miss or vomit a tretinoin dose. Tell the team about vitamin A supplements and show them your list of medicines. Call promptly for severe headache, changes in vision or repeated vomiting.

Medicines, interactions and vaccinations

Ask the cancer pharmacist before starting new medicines. Some antibiotics, anti-sickness medicines and other drugs can affect heart rhythm. Vitamin A supplements and certain antibiotics called tetracyclines can interact with tretinoin. Ask your team what you can safely take, including over-the-counter products and vaccines.

Everyday life

Use a calendar for the capsules and infusion days. Ask how to record symptoms and whether to weigh yourself between visits. Arrange transport and help with meals or childcare when visits are frequent. Ask how to handle and store the capsules and where to return any unused supply.

Pregnancy, fertility and breastfeeding

Discuss contraception and fertility with your team before treatment. Ask how long contraception is needed after each medicine and when breastfeeding can safely resume. Contact the team immediately if you think you may be pregnant during treatment.

After treatment

Ask which blood tests or tests for the leukaemia marker are planned and how you will receive the results. Keep your follow-up appointments. Tell the team if symptoms such as fatigue, numbness or palpitations persist.

Frequently asked questions

Is ATRA the same as a vitamin A supplement?

ATRA is the prescription medicine tretinoin. Ask your pharmacist before taking any vitamin A product.

Why do I need treatment so quickly?

APL can affect blood clotting early on. Starting specialist treatment and monitoring promptly helps manage that risk.

Will I need to stay in hospital?

Induction often begins in hospital. Ask the team what needs to improve before treatment can continue as an outpatient.

What is consolidation?

It is further treatment after the initial response. The goal is to reduce the chance that the leukaemia will return.

What if I miss a capsule or vomit after taking one?

Call your unit or pharmacist and tell them the time and what happened. Follow their advice before taking another capsule.

Why do I have so many ECGs?

Arsenic trioxide can affect the heart rhythm. An ECG helps the team decide whether it is safe to continue treatment.

Why are potassium and magnesium checked?

Low levels can increase the risk of a heart rhythm problem. Your team may replace them before treatment.

How would I notice differentiation syndrome?

Call straight away for new or worsening breathlessness, fever, sudden weight gain or swelling. These can be signs of a reaction as the leukaemia cells mature. Tell the team you are having tretinoin and arsenic trioxide so it can assess you quickly.

Is new bruising important?

Yes. Let the team know promptly, especially early in treatment or if you also have bleeding.

Why might the team pause a drip or the capsules?

Heart rhythm, liver tests, blood salts or symptoms may need attention first. Ask which medicine to pause and when to restart.

Can I take something for a headache?

Ask your team what is suitable. A severe headache, especially with blurred vision or vomiting, needs urgent assessment.

What if I am prescribed an antibiotic elsewhere?

Tell that clinician you are receiving both medicines and ask them to check with your cancer team. Some antibiotics can interact.

Can I travel during treatment breaks?

Ask your team about blood counts, any tests still due and how to get urgent help while away.

How will I know the next phase has started?

Your doctor will discuss the results and give you a new calendar. Ask which medicines, tests and appointments it includes.

What if I feel well but my blood salt result is low?

Your team may replace the mineral and repeat the test before or during treatment. This helps reduce heart rhythm problems. Follow the team's plan rather than choosing a supplement or changing the dose on your own.

Individual medicine guides

- Tretinoin (ATRA)
- Arsenic trioxide (ATO)

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

- Tretinoin capsules - UK SmPC
- Arsenic trioxide (Trisenox) - EU product page with SmPC

Clinical protocols and other references

- APL0406 trial of tretinoin and arsenic trioxide

Additional sources

- Cancer Research UK, arsenic trioxide and tretinoin
- Macmillan Cancer Support, acute promyelocytic leukaemia
- eviQ, tretinoin and arsenic trioxide for standard-risk induction
- eviQ, tretinoin and arsenic trioxide for consolidation

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