



The Essential Guide to Vitamin D

Sources, dosage, testing, safety and choosing thoughtfully

A concise guide for informed choices

Vitamin D is essential, but the dose and the total from every product matter. This guide separates established guidance from marketing claims and shows what to check before buying.

Vitamin D in one minute

What it does. Vitamin D helps the body absorb calcium and phosphorus and supports normal bones and muscle function. Its active form behaves like a hormone.

Where it comes from. Sunlight on skin, a limited range of foods, fortified foods and supplements.

What most UK adults are advised. The NHS advises considering 10 micrograms (400 IU) daily in autumn and winter. People at higher risk should consider it throughout the year.

What not to assume. More is not automatically better. Unless a clinician advises otherwise, adults should not exceed 100 micrograms (4,000 IU) daily from all sources.

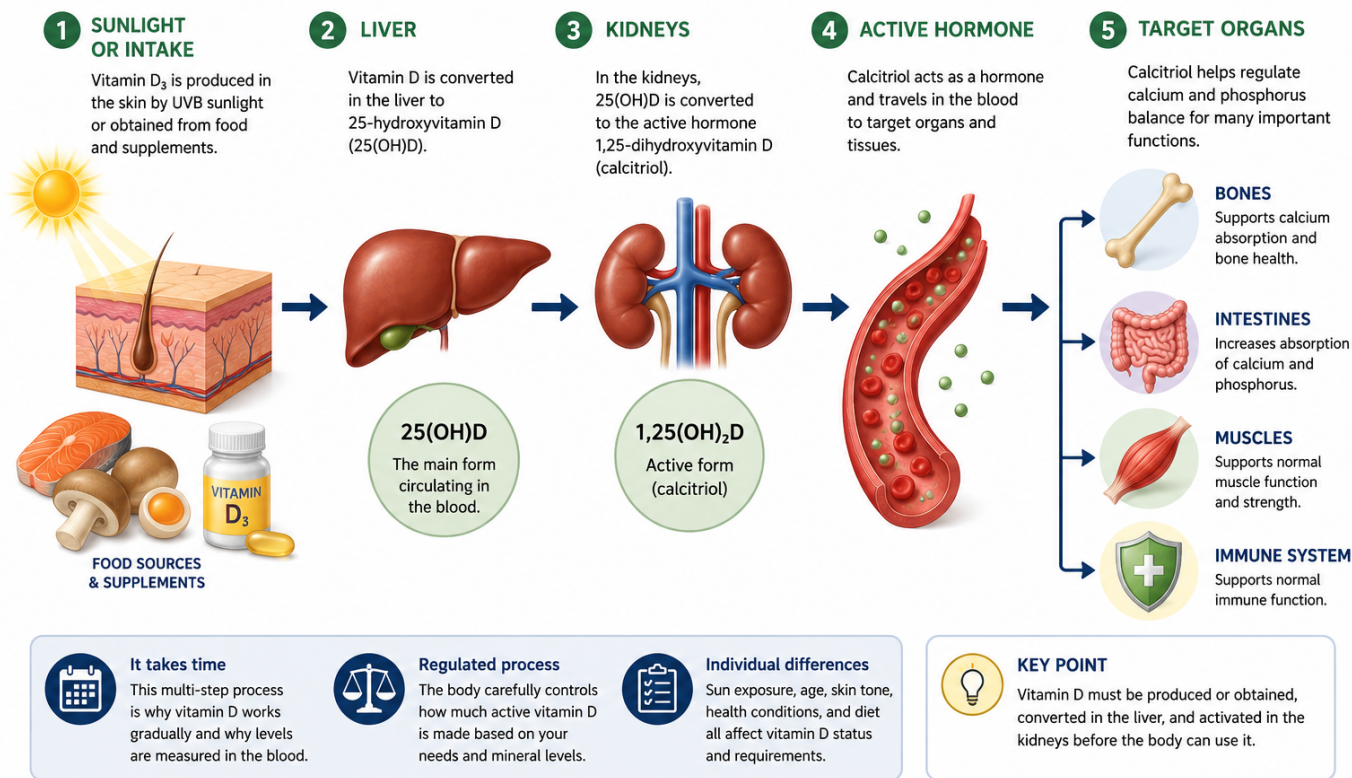
TAFAT rule

Read the serving size, convert micrograms and IU if needed, add every source, and seek professional advice for treatment doses or medical conditions.

From sunlight or intake to active vitamin D

HOW THE BODY ACTIVATES VITAMIN D

A JOURNEY THROUGH SKIN, LIVER, AND KIDNEYS



Educational overview. Individual metabolism and clinical needs vary.

Sunlight, food and supplements

SUNLIGHT

Sunlight is variable.
Season, latitude, time outdoors,
age, skin pigmentation, clothing and
cloud cover all influence production.
Sunburn is not a safe strategy.

FOOD

Food sources are limited.
Oily fish, egg yolks, liver and some
fortified foods can contribute.
Always check the label because
fortification varies.

SUPPLEMENTS

Supplements give a measured dose.
Useful when guidance or individual
circumstances indicate a need. Check D2 or
D3, dose per serving and duplicated
ingredients.

Remember the total

A multivitamin, calcium formula, cod-liver oil, fortified drink and separate Vitamin D product may all contribute to daily intake. Your body adds every source together even when the labels come from different brands.

Maintenance, treatment and safety

UNDERSTANDING VITAMIN D DOSES

Three different numbers. Three very different purposes.



1



RECOMMENDED INTAKE
Daily Maintenance

- ✓ Meets the needs of most healthy people.
- ✓ Helps maintain normal vitamin D status.
- ✓ Intended for everyday use.


EXAMPLE
10 µg
(400 IU)
 for many UK adults
 during periods of limited
 sunlight or for those at
 increased risk.

2



TREATMENT DOSE
For Confirmed Deficiency

- ✓ Confirmed low vitamin D level
- ✓ Higher dose
- ✓ Temporary
- ✓ Medical supervision


 Prescribed by a
 healthcare professional
 after testing.
**Do not self-prescribe
 high doses.**

3



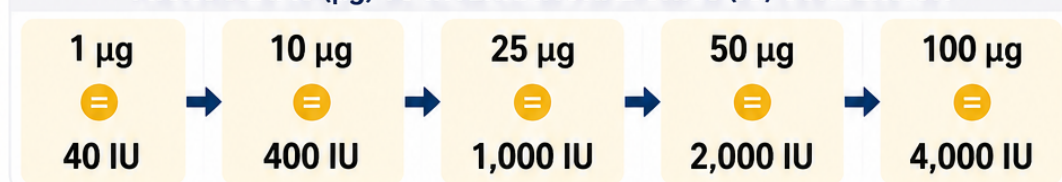
UPPER SAFE LIMIT
Safety Boundary

- ✓ Highest daily intake unlikely to pose a risk for most healthy adults over time.
- ✓ Not a target.
- ✓ More is not better.


100 µg
(4,000 IU)
 per day for most
 healthy adults*
**This is a safety limit,
 not a recommended dose.**

*According to the European Food Safety Authority (EFSA) for adults, including pregnancy and breastfeeding.

MICROGRAMS (µg) TO INTERNATIONAL UNITS (IU) CONVERSION



The right dose depends on you.

Consider your health, sun exposure, diet, and test results.
When in doubt, speak to a healthcare professional.

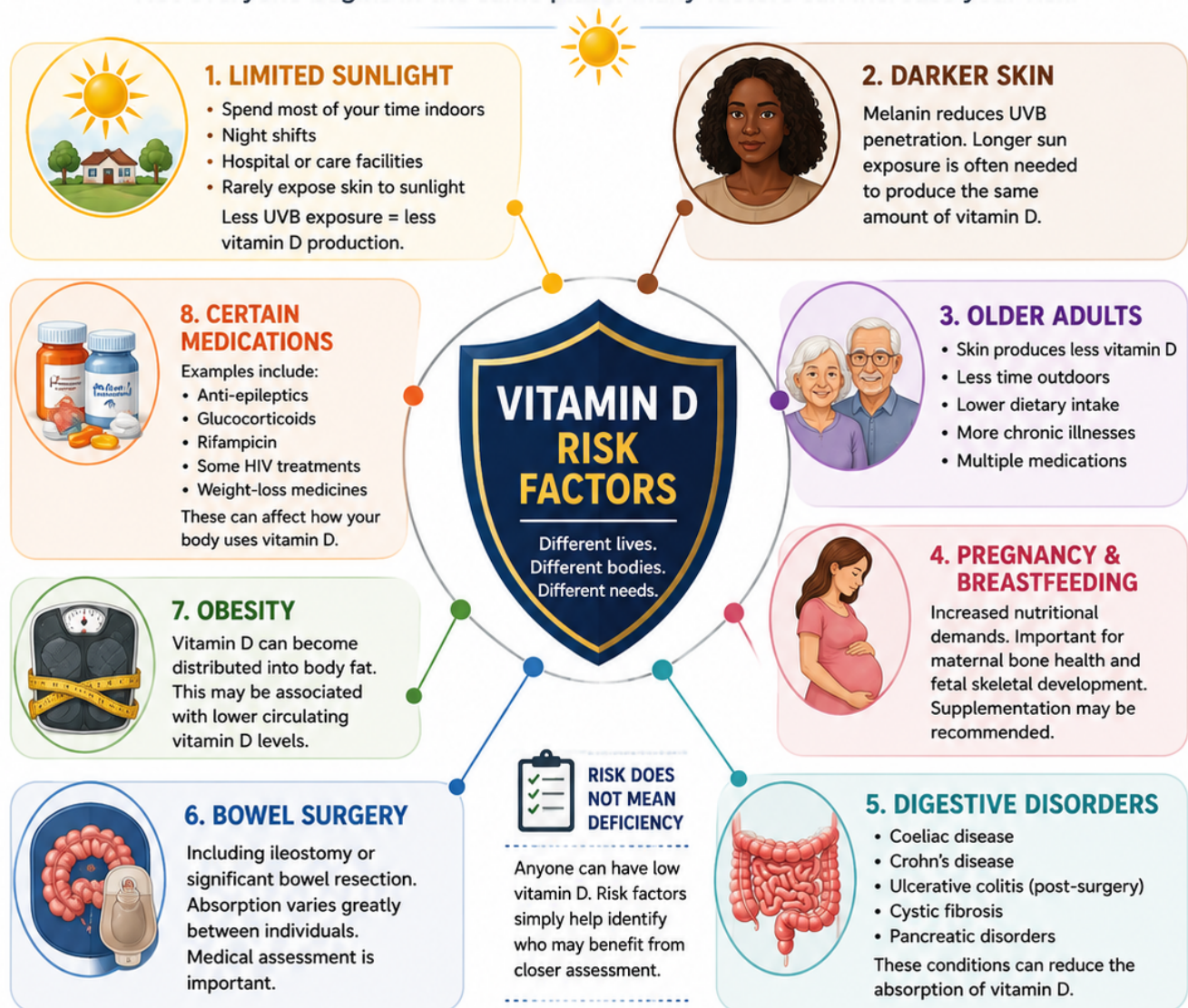


UK guidance shown. Clinician-directed treatment doses may differ.

Who may need closer attention

WHO IS MORE LIKELY TO BECOME VITAMIN D DEFICIENT?

Not everyone begins in the same place. Many factors can increase your risk.



REMEMBER

- ✓ Having one or more risk factors does not confirm deficiency.

- ✓ Symptoms alone cannot diagnose low vitamin D.
- ✓ Blood testing provides the best assessment when there is uncertainty.



TALK TO A HEALTHCARE PROFESSIONAL

They can help you decide if testing or supplementation is right for you, based on your individual health, lifestyle, and circumstances.



i This information is for educational purposes only and is not a substitute for professional medical advice. Always seek the advice of a qualified healthcare professional for any health concerns.

Risk factors do not diagnose deficiency. Discuss uncertainty with a healthcare professional.

Understanding a Vitamin D blood test

UNDERSTANDING YOUR VITAMIN D BLOOD TEST

A blood test is better than guesswork.

WHAT IS THE MAIN TEST?

The usual blood test measures
25-HYDROXYVITAMIN D
25(OH)D

This is the main circulating form of vitamin D and the best indicator of vitamin D from sunlight, food and supplements.



WHY NOT TEST THE ACTIVE FORM?

The active form is
1,25-DIHYDROXYVITAMIN D
1,25(OH)₂D

It is tightly regulated and may stay normal even when stores are low. Usually reserved for specific medical questions (e.g. kidney disease, calcium disorders, unusual metabolism).



For routine assessment of vitamin D status, **25(OH)D** is the relevant test.



Symptoms alone cannot confirm vitamin D deficiency.

Tiredness, pain, low mood and weakness can have many other causes. A blood test helps find the real answer.



Fatigue



Bone pain



Muscle weakness



Poor concentration

UNITS & CONVERSION

Results may be reported in either:

nanomoles per litre
(nmol/L)



nanograms per millilitre
(ng/mL)

1 ng/mL = 2.5 nmol/L

Example: 20 ng/mL = 50 nmol/L
12 ng/mL = 30 nmol/L



SHOULD EVERYONE BE TESTED?

Not necessarily.

Routine testing of every healthy person is not generally recommended.

Testing is more useful when there are symptoms, risk factors, suspected bone disease, malabsorption, unusual calcium results, or a need to monitor treatment.

Ask: Will the result change what happens next?

A SIMPLE INTERPRETATION GUIDE*

25(OH)D RESULT

Below 30 nmol/L
(Below 12 ng/mL)

GENERAL MEANING

Generally considered **DEFICIENT** or **too low**. May be harmful to bone and muscle health.

30 to below 50 nmol/L
(12 to <20 ng/mL)

May be considered **INSUFFICIENT** in some guidance.

50 nmol/L or above
(20 ng/mL or above)

ADEQUATE for most people.

Very high levels
(e.g. >125–150 nmol/L /
>50–60 ng/mL)

May require assessment for excessive intake or toxicity.

*These are broad educational ranges. Different organisations may use slightly different cut-offs. Always interpret in clinical context.

TESTING MAY BE WORTH DISCUSSING IF YOU HAVE:



Unexplained bone pain or muscle weakness



Repeated fractures or bone disease



Malabsorption or bowel surgery (e.g. ileostomy)



Chronic kidney or liver disease



Pregnancy or breastfeeding



Medicines that affect vitamin D metabolism



High or low calcium



Monitoring high-dose vitamin D treatment or suspected toxicity

WHY TIMING MATTERS



Levels can be higher after summer.



Levels can be lower at the end of winter.



Recent high-dose supplements can also influence the result.

DO NOT TREAT THE NUMBER ALONE

A result must be interpreted with the full clinical picture:



Calcium & phosphate



Kidney function



Liver function



Medicines



Symptoms & medical history



Current vitamin D intake

TAFAT TRUTH™



- ✓ Symptoms alone can diagnose vitamin D deficiency **FALSE**
- ✓ 25(OH)D is the usual test for vitamin D status **TRUE**
- ✗ The active form is the best routine test **FALSE**
- ✗ Everyone needs regular vitamin D testing **NOT GENERALLY TRUE**
- ✓ Results should be interpreted in context **TRUE**



KEY POINT

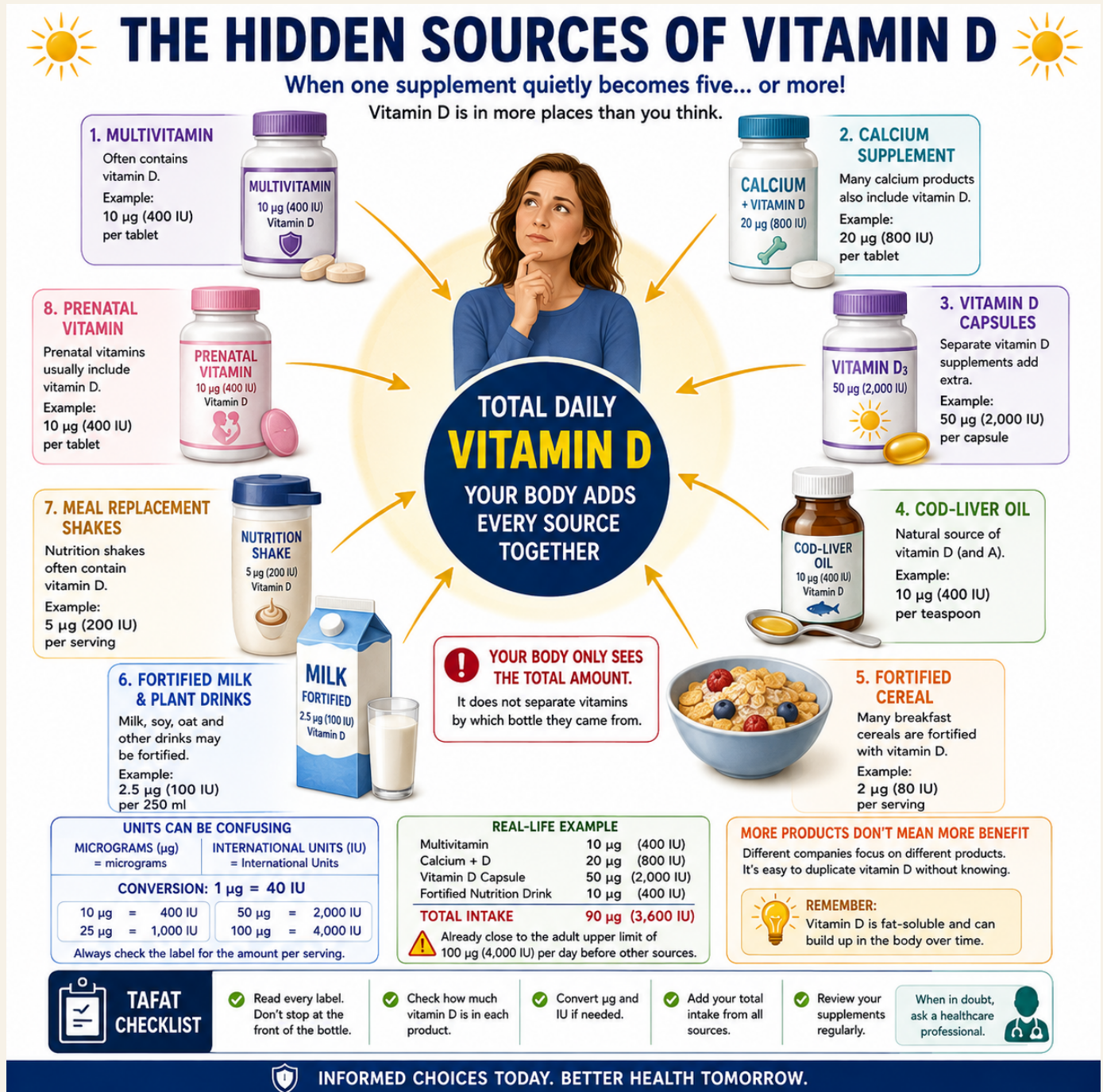
A vitamin D test is most useful when it answers a real clinical question, not when it becomes another number to chase.



This information is for educational purposes only and is not a substitute for professional medical advice. Always seek the advice of a qualified healthcare professional for any health concerns.

Blood results must be interpreted in clinical context.

Hidden sources can quietly add up



Illustrative amounts only. Use the figures on your own product labels.

When Vitamin D becomes too much



WHEN VITAMIN D BECOMES TOO MUCH



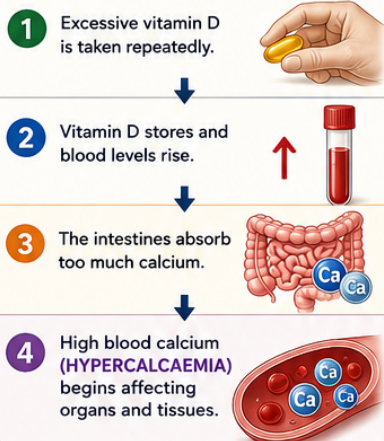
— TOXICITY IS RARE, BUT IT IS REAL —

Vitamin D toxicity is usually caused by taking excessive supplement doses over time, dosing errors, or continuing a high-dose treatment course for too long. It is not caused by ordinary food intake or sensible sunlight exposure.



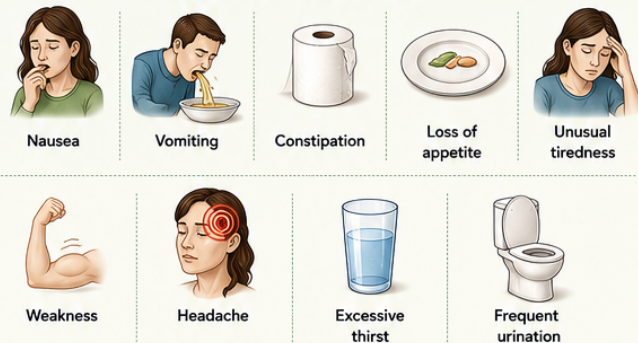
The real problem is excess calcium in the blood (**HYPERCALCAEMIA**), which can harm organs and tissues.

HOW TOXICITY DEVELOPS



EARLY WARNING SIGNS

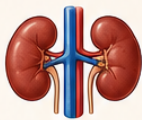
These symptoms may develop gradually.



These symptoms are not unique to vitamin D toxicity and can occur in many illnesses. Do not ignore them if you are taking high doses or multiple vitamin D-containing products.

MORE SERIOUS COMPLICATIONS

High calcium levels can affect many parts of the body.



KIDNEYS

- Kidney stones
- Calcium deposits
- Excessive urination
- Dehydration
- Acute kidney injury
- Reduced kidney function



HEART

- Abnormal heart rhythms
- Palpitations
- Increased strain on the heart



BRAIN & NERVES

- Confusion
- Difficulty thinking
- Disorientation
- Fatigue
- In severe cases, stupor or coma



DIGESTIVE SYSTEM

- Persistent nausea
- Vomiting
- Constipation
- Abdominal pain



MUSCLES

- Muscle weakness
- Aches
- Reduced coordination



SOFT TISSUES

- Calcium deposits in blood vessels, lungs, and other organs (rare)



Severe hypercalcaemia can become a medical emergency.

SUNLIGHT IS NOT THE PROBLEM



The skin has natural regulatory mechanisms that limit vitamin D production.



Sunlight does not normally cause vitamin D toxicity. Supplements are the usual cause.

FACTORS THAT INCREASE RISK

- ✓ High supplement doses for long periods
- ✓ Taking multiple vitamin D-containing products
- ✓ Kidney disease or reduced kidney function
- ✓ High calcium intake
- ✓ Certain medicines (e.g. thiazide diuretics)
- ✓ Sarcoidosis or other granulomatous diseases
- ✓ Dehydration
- ✓ Dosing errors or manufacturing errors

WHAT TO DO IF EXCESS IS SUSPECTED

- ✓ Seek prompt medical advice.
- ✓ Stop high-dose supplements only under professional guidance.
- ✓ Bring all supplement and medicine containers or clear photos of labels.
- ✓ Tests may include 25(OH)D, calcium, kidney function, phosphate, PTH, urine calcium, and medicines review.



SAFE UPPER LIMIT FOR MOST HEALTHY ADULTS



Do not exceed **100 µg (4,000 IU)** per day from all sources unless directed by a clinician.

HOW THE UNITS COMPARE

1 microgram (µg) = 40 IU

Micrograms (µg)	10 µg	25 µg	50 µg	75 µg	100 µg
International Units (IU)	400 IU	1,000 IU	2,000 IU	3,000 IU	4,000 IU

REMEMBER



Essential does not mean harmless at every amount. Dangerous at excessive doses does not mean unsafe at appropriate doses.



SEEK MEDICAL ADVICE FOR:



Persistent vomiting



Severe thirst



Frequent urination



Confusion



Marked weakness



Dehydration



Abnormal heartbeat

EARLY RECOGNITION AND REVIEW CAN PREVENT SERIOUS COMPLICATIONS.



Informed Choices. Better Health.

Know your dose. Know your total. Review your plan.



Every bottle tells only part of the story. Your body adds every source together.

Toxicity is usually linked to excessive supplement intake, not ordinary sun exposure.

The five-minute label check

1

Serving size

Is the stated dose per capsule, per spray or per several gummies?

2

Vitamin D amount

Check both micrograms and IU. 1 microgram equals 40 IU.

3

Every source

Add Vitamin D from multivitamins, calcium blends, oils and fortified products.

4

Product evidence

Look for transparent labelling, batch testing and realistic claims.

5

Your circumstances

Ask a pharmacist or clinician if you take medicines, have kidney or calcium disorders, are pregnant, or need a treatment dose.

Choose the format, then judge the label

Tablets and capsules

Often simple and economical. Check dose per unit and whether the serving requires more than one.

Gummies

Convenient, but check sugars, sweeteners, the number required per serving and storage warnings.

Liquids and sprays

Useful for people who dislike tablets. Follow the measuring or spray instructions exactly.

D2 and D3

Both can raise Vitamin D status. D3 often produces a larger or more sustained increase in 25(OH)D, but suitability and dose remain more important than marketing language.

Do not let the packaging make the decision.

A premium bottle does not prove a premium formulation. TAFAT reviews the actual dose, serving size, transparency, claims and value.

How products earn a place in the shop

Ingredient transparency

The form and amount must be easy to identify.

Label clarity

Serving size, units and directions must be understandable.

Scientific restraint

Claims should remain within established evidence.

Manufacturing signals

Independent testing or credible quality systems are considered.

Value and fit

The product must serve a clear need without unnecessary overlap.

Reviewed and referenced

NHS

Vitamin D: vitamins and minerals guidance. Includes UK intake, seasonal supplementation and upper-limit advice.

<https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/>

NIH Office of Dietary Supplements

Vitamin D Fact Sheet for Health Professionals. Covers physiology, status, evidence, safety and interactions.

<https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>

NIH Office of Dietary Supplements

Vitamin D Fact Sheet for Consumers. Plain-language safety and upper limits.

<https://ods.od.nih.gov/factsheets/VitaminD-Consumer/>

European Food Safety Authority

Summary of tolerable upper intake levels for vitamins and minerals. Version 10, June 2024.

https://www.efsa.europa.eu/sites/default/files/assets/UL_Summary_tables.pdf

Health note

This guide is educational and is not a diagnosis or a substitute for personalised medical advice. Product availability, formulations and guidance can change; check current labels and speak with a qualified healthcare professional when needed.