

Recently, the ultraviolet rays have become stronger, but is it really best to avoid them completely?



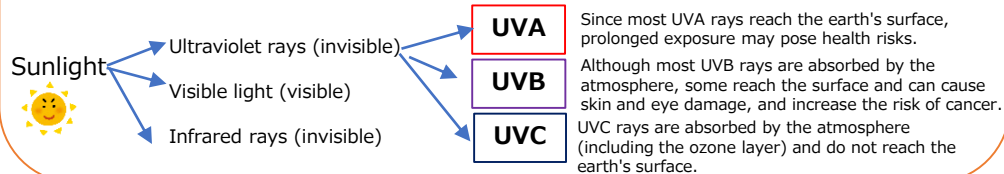
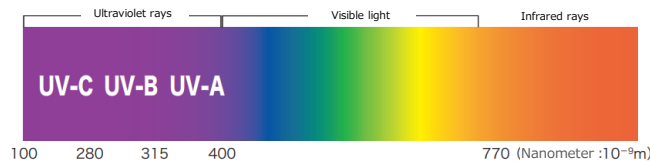
Although excessive exposure to ultraviolet rays should be avoided, **sunlight also helps produce vitamin D**, so it's not good to completely avoid sun exposure either.



First, let's take a look at what ultraviolet rays are!

#### What are ultraviolet rays?

Ultraviolet (UV) rays are categorized into types C, B, and A, based on their wavelength regions and associated characteristics, in order of increasing wavelength.



#### Infrared Quiz



Can you get a suntan on a cloudy day?



Even with thick clouds, ultraviolet rays, especially UVA, can penetrate. Additionally, haze in the air can increase UV exposure.



Does water block ultraviolet rays?



Water only blocks a small amount of ultraviolet rays. Also, reflections from the water surface can increase UV exposure.



Are people with lighter skin more susceptible to the effects of ultraviolet rays?



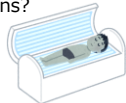
The more eumelanin (dark brown pigment) there is in the skin, the darker it becomes, absorbing ultraviolet rays and minimizing DNA damage. Note: People who tend to turn red rather than tan when exposed to sunlight are highly sensitive to UV rays and require more protection.



Can you get a healthy tan from the UV rays in tanning salons?



Excessive exposure to UV-A can cause potential issues like blisters and hyperpigmentation, and damage to DNA, leading to an increased incidence of melanoma as noted by the WHO.



## About Ultraviolet Rays and Vitamin D

### Health Hazards Caused by Ultraviolet Rays

- "Acute injuries" = Immediately observed upon sun exposure
- "Chronic injuries" = Appear over years of continuous exposure

### Acute injuries

#### ① Sunburn



#### ② Ultraviolet Keratitis

Redness of the conjunctiva (white of the eye), foreign body sensation, tearing, which can lead to severe eye pain if worsened.



#### ③ Decreased immune function



### Chronic injuries

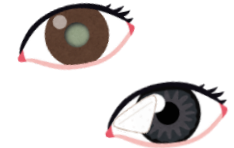
#### <Skin>

- ① Wrinkles
- ② Skin spots
- ③ Benign tumors
- ④ Precancerous conditions\*1 (actinic keratosis, malignant nevi)
- ⑤ Skin cancer



#### <Eyes>

- ① Cataracts\*2
- ② Pterygium\*3



- \*1: Precancerous tumors that occur as a result of skin being exposed to sunlight over many years.
- \*2: Initial symptoms: The lens of the eye hardens, accelerating presbyopia, and as the cloudiness intensifies, vision deteriorates.
- \*3: The conjunctiva (white part of the eye) grows in a wing-like (triangular) shape into the cornea (black part of the eye), leading to visual impairments such as astigmatism, necessitating surgery.

### Ultraviolet Protection Measures

#### ① Avoid peak UV hours



Especially strong around noon

#### ② Use shade

#### ③ Use a parasol or wear a hat



Be careful not to overdress and suffer heat stroke!

#### ④ Cover up with clothing



Tightly woven fabric is best. Try holding the fabric up to the sun to see how much light gets through!

#### ⑤ Wear sunglasses



Choose lenses with a high UV protection rate!

#### ⑥ Use sunscreen effectively



Reapply every 2-3 hours! Sunscreen can easily wash off with sweat or wear off due to clothing.



## Ultraviolet Rays and Vitamin D



Vitamin D can increase calcium absorption from the intestines by about **2 to 5 times**.

### ① Main Functions of Vitamin D

1. Helps absorb calcium and maintains strong bones.
2. Essential for the immune system to fight off bacteria and viruses that invade the body.

### ② Characteristics of Vitamin D



1. Vitamin D is obtained from two sources: food and sunlight ultraviolet rays.
2. Many people rely on **sunlight ultraviolet rays** for more than half of their required Vitamin D.

Is it impossible to get enough Vitamin D from diet alone?



Vitamin D is abundant in mushrooms and fish, but is present in only small amounts in other foods, and few people get the necessary amount from their diet alone.



### <Recommended Daily Intake of Vitamin D>

Under 1 year old	400IU
Ages 1-70	600IU
Over 71 years old	800IU
Pregnant and breastfeeding women	600IU

### <Vitamin D content in food (daily requirement is 10-25 µg)>

Food	Single intake (g)	Vitamin D (µg) [IU]
Salmon	60	19.2 [768]
Grilled eel	100	19.0 [760]
Pacific saury	60	11.4 [456]
Flounder	60	10.8 [432]
Grunt	60	9.0 [360]
Beltfish		8.4 [336]
Flatfish	60	7.8 [312]
Swordfish	60	6.6 [264]
Boiled and dried fish	30	6.3 [252]
Wood ear mushrooms	1	4.4 [176]

From the Fifth Revised and Supplemented Japanese Food Composition Table.

### ③ Health Risks from Vitamin D Deficiency

- **Osteomalacia & Rickets:** Bones become soft, easily bendable, and have difficulty growing.



- **Osteoporosis**
- **Cramps**
- **Weakened immune**



### Increasing Vitamin D Deficiency in Infants

#### <Possible Causes>

- An increasing trend of women avoiding sun exposure.
- Exclusive breastfeeding and elimination diets for conditions like atopic dermatitis also pose risk factors.
- Insufficient sun exposure after birth.



Babies have thin skin, so it's important to be careful with strong sunlight!

Formula milk contains Vitamin D, considering the nutritional needs of babies.

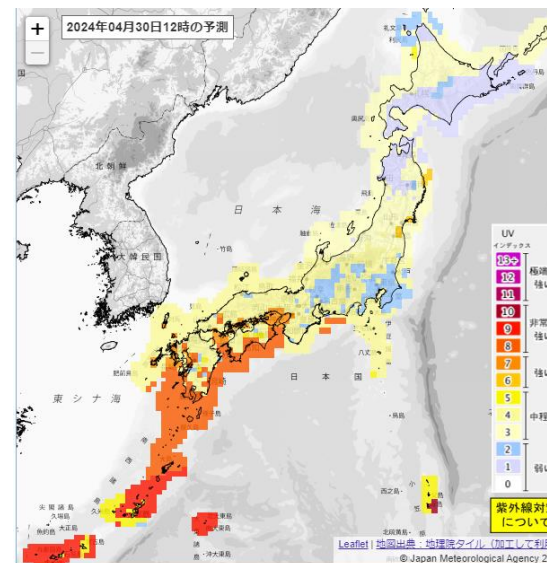


### ④ Characteristics That Reduce Vitamin D Production by Ultraviolet Light

- Ultraviolet rays coming through indoor windows.
- Cloudy days and shade.
- People with darker skin tones.
- Sunscreen, parasols, hats, long sleeves, and other sun protection gear.
- Older adults.



### ⑤ How much sun exposure is needed to produce Vitamin D?



From the Japan Meteorological Agency, Ministry of Land, Infrastructure, Transport and Tourism (April 30, 12:00 PM UV Forecast Map, Tokyo weather: cloudy)

### Many people wonder, "How many minutes of sunbathing is sufficient?"

However, the answer varies widely depending on several factors such as **location, season, time of day, weather, clothing, skin color (skin type), and age**. Therefore, there is no uniform answer like "XX minutes" that has been officially declared.

Therefore, as a reference, we provide examples of the "hourly sunlight exposure required to produce 5.5 µg (220 IU) of Vitamin D" in July and December for different locations such as Sapporo, Ibaraki, and Okinawa.

	July (12 PM)	December (12 PM)
Sapporo	4.6mins	76.4mins
Tsukuba	3.5mins	22.4mins
Naha	2.9mins	7.5mins

From the National Institute for Environmental Studies, a National Research and Development Agency

### Summary



Considering Vitamin D, **a short duration of sunbathing is necessary**. However, it's also true **that ultraviolet rays can have carcinogenic effects**. We need to balance these two aspects wisely!

1. Those exposed to ultraviolet rays should take precautions against sunburn!
2. Those who don't go outside should try to get a few minutes of sunlight!
3. Make an effort to include Vitamin D in your diet!
4. Make good use of supplements!

Taking too much of a supplement can also lead to **health issues**, so be sure to stick to the recommended amount!

For those undergoing **medical treatment**, it's important to consult with a doctor or pharmacist!



Correct Usage of Health Foods  
From the Ministry of Health, Labour and Welfare

[https://www.mhlw.go.jp/topics/bukyoku/iyaku/syoku-anzen/dl/kenkou\\_shokuhin00.pdf](https://www.mhlw.go.jp/topics/bukyoku/iyaku/syoku-anzen/dl/kenkou_shokuhin00.pdf)