Time	Narration
00:01	Welcome to the spoken tutorial about the importance of vitamin D .
00:07	In this tutorial we will learn about:
00:10	Role of vitamin D in the body.
00:14	Symptoms of its deficiency.
00:17	Recommended intake.
00:19	Food sources.
00:22	Let us begin by briefly understanding what is vitamin D .
00:28	Vitamin D is a fat soluble vitamin .
00:32	It exists in two forms: Vitamin D3 and
00:37	Vitamin D2.
00:40	D3 is mainly produced by the skin on exposure to UVB rays from sunlight.
00:49	UVB is known as ultraviolet B rays.
00:55	It is one of the 3 types of sun rays.
00:59	You can also get small amounts of D3 from non-vegetarian foods.
01:06	Vitamin D2 however is present in a few vegetarian foods.
01:13	Supplements of both Vitamin D2 and D3 are available in the market easily.
01:21	Interestingly, Vitamin D obtained from all these sources is inactive.
01:28	To become active, it has to undergo two processes.
01:33	First process of activation is in the liver and the second is in the kidney.
01:41	Active form of vitamin D , also known as calcitriol , is formed in the kidney.
01:49	Once vitamin D gets activated, it plays several roles in the body.
01:56	One of the major roles is formation and maintenance of strong bones.
02:03	Another is the absorption of calcium in the intestine.
02:09	Maintaining the levels of calcium and phosphate in the blood is another role.
02:16	These two nutrients are required for growth and repair of bones.
02:22	They help in maintaining the correct bone density in our body.
02:29	Apart from bones, they also help in maintaining strong teeth and
02:35	muscles.
02:37	Vitamin D is an immunomodulator .
02:41	This means that it helps in controlling and supporting the immune system.
02:48	It helps to activate the body's natural response to fight diseases.
02:55	Vitamin D protects the body against several respiratory infections.
03:02	For example: pneumonia ,
03:04	influenza,
03:06	tuberculosis (TB)
03:08	and COVID-19.
03:11	Reduction in inflammation in the body is aided by vitamin D .
03:17	Its other properties are to protect the body from viruses, bacteria and fungi.
03:26	Vitamin D is found to improve insulin sensitivity.
03:31	Therefore, it helps in managing diabetes,

03:36 and body weight. 03:39 It also maintains good heart health. 03:49 For many other functions in the body, vitamin D is essential. 70:349 For example: cell division, 03:55 For example: cell division, 03:56 brain development and 04:00 prevention of cancer. 04:10 It us see what factors put someone at risk for vitamin D deficiency. 04:11 Let us see what factors put someone at risk for vitamin D deficiency. 04:12 It us see what factors put someone at risk for vitamin D in the skin. 04:25 UVB rays from sunlight are required to produce vitamin D in the skin. 04:33 Glass windows block these UVB rays in the house. 04:33 Hence, people with limited exposure to sunlight are at risk of deficiency. 04:46 For example: old people and people mostly working indoors. 04:53 Vitamin D deficiency is common in winter or in regions with cold climate. 05:06 They have high amounts of a pigment called melanin in their skin. 05:12 They have high amounts of a pigment called melanin in their skin. 05:12 They require longer exposure to sunlight as compared to light skinned people. 15:34 Additionally, vitamin D requires fat for its absorption. 05:34 Hence, people with reduced ability to absorb fat can suffer from deficiency. 06:35 Individuals with liver or kidney diseases are also at risk of deficiency. 06:36 Conversion of vitamin D to active form takes place in the kidney and liver. 16:37 Hence, people with liver or kidney diseases are also at risk of deficiency. 06:38 Oconversion of vitamin D to active form takes place in the kidney and liver. 16:39 Obese people and those who have had bypass surgery can also become deficient. 16:30 Pregnant and breastfeeding mothers need vitamin D for the foetus 16:31 Otherwise, the mother is at risk of becoming deficient in vitamin D. 16:32 Otherwise, the mother is at risk of becoming deficient in vitamin D. 16:37 Next, let us understand the effects of vitamin D deficiency. 16:38 Signs of deficiency may vary with severity and age group. 16:39 Ower of the general signs are	03:34	blood pressure
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		Thus, there is an increased chance of catching infections.

07:24	It also results in an increase in inflammation in the body.
07:30	All this makes a person more susceptible to getting infected with COVID-19 .
07:37	The severity of effects of COVID-19 and
07:41	death due to it rises with deficiency.
07:46	The risks of several cancers also increase due to deficiency of vitamin D .
07:54	Cancer of colon, prostate and breast are a few examples.
08:02	Low vitamin D levels can raise the risk of multiple sclerosis .
08:07	It is a condition in which protective covering of the nerve is damaged.
08:14	This disrupts the communication between the brain and body.
08:19	It affects the brain, spinal cord and optic nerves.
08:25	Deficiency of vitamin D during pregnancy can result in a rise in blood pressure.
08:33	It can have negative effects on the baby also.
08:37	There can be an increased risk of premature birth and
08:42	low birth weight babies.
08:45	Babies born to mothers with vitamin D deficiency, will also be deficient.
08:52	Vitamin D deficiency can cause rickets in infants and children.
08:59	Rickets is a disorder of the skeletal system.
09:04	The growth gets stunted and there are changes in the shape of the spine.
09:10	Other signs are sunken ribs, protruding forehead and bow shaped bent legs.
09:18	Widening of the wrist, elbow, knee and ankle joints can be seen.
09:25	Children with rickets are also at a risk of getting infectious disease.
09:31	There is a delay in tooth eruption.
09:34	A pot belly and an abnormal walk is also seen.
09:39	Muscle pain, irritability and increased sweating are other signs.
09:46	In adolescents and adults, deficiency causes osteomalacia.
09:52	It is a condition of weakening and softening of bones.
09:57	The bones become easily prone to fractures.
10:01	Severe pain in back,
	hips,
10:03	pelvis
10:05	and legs can occur.
10:08	Other signs include muscle weakness and spasms.
10:13	To avoid deficiency, getting adequate vitamin D is important.
10:19	For infants of 0 to 12 months, 400 IU or 10 micrograms per day is recommended.
10:30	600 IU or 15 micrograms per day is recommended for people of age group 1 to 70 years.
10:42	This includes children, adolescents, adults, pregnant and lactating mothers.
10:51	For men and women above 70 years, 800 IU or 20 micrograms is recommended.
11:01	Many experts recommend much higher doses.
11:05	Let us now learn how to get adequate vitamin D .
11:10	Our body can produce it on exposure to UVB rays of the sunlight.
11:16	The best time to get maximum UVB rays is from 11 a.m to 2 p.m
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11:26	15 to 20 minutes of daily exposure to midday sunlight is recommended.
11:33	For dark skinned people, 3 to 5 times longer exposure in sunlight is needed.
11:41	Approximately 10,000 IU of vitamin D is generated during this time.
11:49	Note that the body can't make vitamin D if you are seated indoors by the window.
11:56	This is because the glass blocks the UVB rays.
12:01	Hence, you should get sunlight from outdoors.
12:05	You can even keep the windows open and let the sunshine in.
12:11	Next, let us look at food sources of vitamin D .
12:16	Only a small amount of vitamin D can be obtained from foods.
12:22	Among which fish are the best sources.
12:26	For example: sardine, herring (hilsa -Hindi), black pomfret, salmon and cod.
12:33	100 grams of sardines has 3.5 microgram of vitamin D .
12:41	100 grams of herring fish (hilsa -Hindi) has about 5 microgram of vitamin D .
12:48	Other seafood like prawns and crabs also have little amounts of vitamin D .
12:56	100 grams of prawns have about 1 microgram .
13:02	Other non-vegetarian sources of vitamin D are egg yolk and
13:07	chicken liver.
13:09	100 grams of chicken liver has about 2.6 microgram of vitamin D .
13:17	2 egg yolks of about 40 grams have nearly 1.3 micrograms .
13:24	Few vegetarian foods have vitamin D .
13:27	For example: mushrooms, soyabean, finger millet, sesame seeds.
13:34	100 grams of mushroom has around 20 micrograms .
13:39	50 grams of soybean has 33 micrograms .
13:45	However, along with intake, absorption is very important.
13:50	Vitamin D3 is better absorbed and used in the body as compared to D2 .
13:58	Hence, sunlight and non-vegetarian food are best sources of vitamin D .
14:05	Please consult your doctor before taking any supplements.
14:10	This brings us to the end of the tutorial. Thanks for joining.