Indian Academy of Pediatrics (IAP)

GUIDELINES FOR PARENTS

Vitamins and Minerals for My Child

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10 FAQs on VITAMINS AND MINERALS FOR MY CHILD

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Vitamins and Minerals for My Child

Q1

What is the importance of vitamins for my child's health?

Vitamins are essential nutrients that are required in small amounts to enable various functions in the body. Children need vitamins for growth, development, and normal functioning of their body **(Table 1)**.

TABLE 1: Importance of vitamins.

Vitamin	*Importance*
A 	Normal vision and immunity.
B Complex 	Helps in various chemical reactions that help to convert food to energy

B_{12} 	Helps in normal functioning of the brain and nerves
C	Helps in body repair, wound healing, immunity and maintenance of bone and teeth
D 	Helps in absorption of calcium and building bones
E	It is an antioxidant and helps in cell repair
K	Helps in blood clotting

- Most vitamins cannot be produced by the body and need to be consumed in the diet.
- Children of all ages need a sufficient intake of vitamins. Newborns and infants need them especially, because of their rapid growth. Older children may need additional vitamin intake during recovery from illnesses and when they are deficient. Adolescents also need adequate vitamins, especially folic acid and vitamin B_{12} (which they may be deprived of due to faulty dietary habits and junk foods) due to increased growth.

Q2

What should I know about vitamin D with respect to my child's health?

- Vitamin D is a nutrient that helps the body to absorb and retain calcium. It, thus, helps to form and maintain strong bones. It may also play a role in immunity. Whether it has a role to play in many other aspects of the body's functioning is a matter of debate and is still being studied.

- Vitamin D is known as the "sunshine vitamin" as the body can make vitamin D in presence of sunlight. This explains the traditional practice of keeping babies for brief periods in sunlight. Natural food can contribute a little. Abroad, foods fortified with vitamin D are commonly available and serve as additional sources; in India, availability of such foods is limited.
- Since diet has limitations and sun exposure can be affected by pollution, dark skin or other limitations, vitamin D supplements may be required in situations such as newborn babies (especially premature), children with diseases of absorption, liver diseases, kidney diseases, in clinical deficiency states, and when on certain medications.
- Vitamin D deficiency can lead to weakening of bones (disease called "rickets" in young children). As a result, the leg bones may "bend". Besides, it can also lead to delay in walking and teething, an increased risk of fractures, and low blood calcium.
- Excess of vitamin D can also cause harm (see Question 10).

Q3

What is the importance of minerals for my child's health?

Minerals are chemical elements that are necessary for overall good health; specifically, they help in maintaining various functions of the body.

- *Calcium* is necessary for: (a) formation of bone and teeth; (b) contraction of all muscles including the heart; (c) clotting of blood; and (d) relay of electrical and chemical messages to all cells of the body. In short, calcium controls many life processes.
- *Phosphorus and magnesium* are also needed to keep bones strong. They are also important for the working of all cells of our body.
- *Sodium, potassium, and chlorides* are also called as electrolytes because they transmit minute electrical currents generated by nerves and muscles. Besides, sodium maintains blood pressure and the water balance in the body.
- *Iron* is crucial for the formation of hemoglobin which carries oxygen to all parts of the body. It is an important part of many enzymes—these facilitate various chemical reactions that happen daily in the body. It also plays a role in immunity.
- *Iodine* is the raw material needed to produce thyroid hormones which are extremely important for the developing brain of an infant and young child. In fact, thyroid hormones influence many parts of the body and are like the "master of the orchestra" all throughout life.
- *Zinc* plays a role in growth and immunity.
- *Fluorine* is important for teeth and bones.

Q4

What kind of food will provide enough vitamins for my child?

Different foods are rich in different vitamins and minerals—so regular consumption of a wide variety of foods provides enough vitamins and minerals **(Table 2)**. In general, fresh fruits and vegetables are good sources.

TABLE 2: Plant, animal, and other sources of vitamins.

Vitamin	*Plant sources*	*Animal sources*	*Other sources*	*Remarks*
A 	Green leafy vegetables (spinach, amaranth), most green and yellow fruits and vegetables (e.g., papaya, mango, pumpkin, and carrots)		*Fortified foods:* Ghee, margarine, milk	The darker the green leaves, the higher its content
D 	Mushroom	Liver, egg yolk, butter, cheese, fish, fish-liver oils	Produced in the body by the action of ultraviolet (UV) rays of sunlight on a substance that acts as raw material and is stored in large amounts under the skin *Fortified foods:* Milk, margarine, vanaspati, and infant foods	• UV rays may be blocked by pollution, dark skin • Natural foods alone cannot meet daily requirements because they contain small amounts—you cannot eat 10 eggs daily
E	Widely distributed in foods			
K	Fresh green vegetables (especially dark green ones), some fruits		*Main source:* Produced by friendly germs in the intestines	
B Complex 	Green leafy vegetables	Milk, eggs, meat, liver, and fish		Whole grain, cereals, and pulses contain small amounts but are an important source because of the quantity consumed

Contd...

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Vitamin	*Plant sources*	*Animal sources*	*Other sources*	*Remarks*
C 	Fresh fruits, green leafy vegetables, germinating pulses, amla, guava			Destroyed by heat
B_{12}	None	Milk, eggs, meat, and fish		

Q5

What kind of food will provide enough minerals for my child?

Major minerals are those that are required in larger amounts. Trace elements are required in smaller quantities **(Table 3)**.

TABLE 3: Plant and animal sources of minerals.

Mineral	*Plant sources*	*Animal sources*	*Remarks*
Calcium	Custard apple (*Sitaphal*), green leafy vegetables, cereals, and millets	Milk and milk products (e.g., cheese, curd, skimmed milk, and butter milk), eggs and fish	• Poorly absorbed from green leafy vegetables and cereals • Ragi is rich, rice is poor
Phosphorus	Widely distributed in foods		• Deficiency is very rare
Iron	Cereals, green leafy vegetables, legumes, nuts, oilseeds, jaggery and dried fruits—iron is poorly absorbed	Liver, meat, poultry, fish—iron is better absorbed	• Milk is very poor in iron • Pure vegetarians are at higher risk of deficiency
Sodium	Common salt, and it is present in many foods.		• Requirement depends on physical activity and how much the child sweats
Potassium	Fresh fruits (sweet lime, banana, and papaya), coconut water		• Potassium in the body may reduce after few days of not eating (like after short illnesses)
Iodine	Small amounts in various foods and water depending on soil content of iodine	Sea foods are rich in iodine	• Occasionally, cabbage and cauliflower may not allow iodine to be used by the body
Fluorine	Tea	Sea food, cheese	• Main source is drinking water • Toothpastes are fluoridated
Zinc	Widely distributed	Meat, milk, fish	• Deficiency may occur in undernourished children and after diarrheal illness

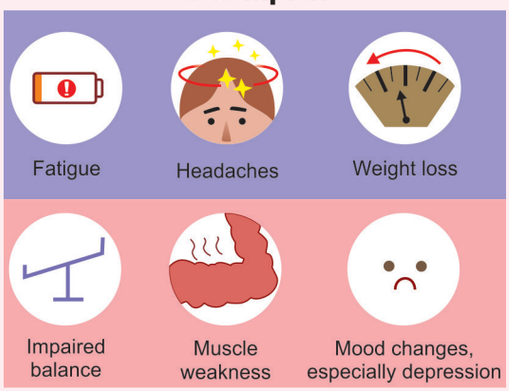
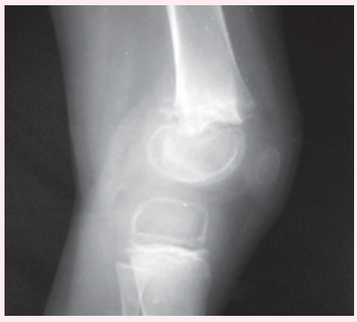
Usually, food almost always provides the other trace elements, and their excess can harm; so they are not needed as supplements.

Q6

How will I know if my child is deficient in any vitamins?

The following complaints in your child may suggest vitamin deficiencies. However, your doctor needs to confirm it; the same complaint can be due to reasons other than deficiencies **(Table 4)**.

TABLE 4: Complaints due to vitamin deficiency.

Vitamin	*Complaints*
A 	• "Dry eyes" • Finds it difficult to see what others can see in darkness (night blindness) • Has wrinkled or brownish spots on the white of the eye • Suffers from frequent tummy or chest infections
B Complex 	• Poor appetite, weakness, and irritability • Delayed achievement of normal milestones such as standing and speaking (developmental delays) • Sores on lips and tongue • Nerve-related complaints • Mood changes
C 	• Swelling of gums, bleeding from gums while brushing • Easily getting bruised with trivial injury which normally should not have caused a bruise. • Pain in limbs or joints • Slow wound healing • Dry hair
D	*See Question 2 above*

- Vitamin E deficiency is uncommon.
- Vitamin K deficiency occurs in special situations and will be suspected by your doctor.

Q7

How will I know if my child is deficient in any minerals?

The following complaints in your child may suggest mineral deficiencies **(Table 5)**. However, your doctor needs to confirm it; the same complaint can be due to reasons other than deficiencies.

TABLE 5: Complaints due to mineral deficiencies.

Mineral	*Complaint*
Calcium	• Calcium deficiency is usually due to vitamin D deficiency, so the complaints are those of vitamin D deficiency • Besides, muscle cramps, and occasionally fits (in young babies) can occur
Iron	Tiredness, lack of concentration, irritability, poor appetite, looking pale
Iodine	Lethargy, delayed development, swelling in front of neck, not growing in height
Sodium	Muscle cramps
Potassium	Weakness

Q8

Do I need vitamin and mineral supplements for my child?

If a child consumes a balanced food, logically he should get all the vitamins and minerals. But, this may not always be so.

- In the general population, many children do not get enough vitamin A and consequently suffer from the ill effects of its deficiency. Children who are severely undernourished, have measles, have long-standing diarrhea or problems in absorbing food, long-standing liver disease, and eye complaints that suggest vitamin A deficiency should receive vitamin A supplements.
- Since young babies are growing rapidly and since one cannot rely on sunlight and dietary sources to meet their requirements, vitamin D supplements are recommended for infants. In older children, the need for supplements may have to be decided on a case-to-case basis.
- A child whose diet is poor in iron may need iron supplements. Adolescent girls may also need them.
- Zinc may need to be supplemented in undernourished children or after a diarrheal illness.

On an individual basis, you may discuss with your doctor whether your child needs supplements. On a routine basis, these are not required in an otherwise healthy child. They are not appetite stimulants.

Q9

What are the myths associated with vitamins and minerals (effect on immunity, memory, etc.)?

Certain complaints in children can be related to deficiencies of a vitamin or mineral. But, in the absence of a deficiency, the same complaint can occur due to some other reasons and will not get sorted by supplementing that vitamin or mineral.

- For example, deficiency of iron can contribute to learning difficulties or a poor appetite, but in the absence of deficiency, iron or any other vitamin or mineral does not strengthen memory, boost intelligence, or stimulate appetite.
- Above normal levels of vitamins and minerals do not confer any extra advantages or boost immunity.
- Many of the benefits claimed for vitamin D like improvement in asthma are still unproven.
- Aches and pains in children can be due to various reasons; vitamin D is not the solution for one and all.
- Another misconception is that vitamin A will improve eyesight and correct refractory error; both are incorrect.
- Vitamin C does not prevent colds and coughs.

When supplements are needed, products sourced from abroad are not necessarily superior to locally available brands.

Q10

Can an excess of vitamins and minerals harm my child in any way?

As they say, "*Anything in excess is poison*". Even vitamins and minerals can lead to serious health concerns when an excess is consumed. So, they should be used only when prescribed by the pediatrician.

- *Vitamin A* is often prescribed for some skin problems in a high dose or for a long time. Some parents believe cod-liver oil capsules are good for health. When these high-dose preparations are consumed for a long time, excess vitamin A can accumulate in the body and can increase the pressure inside the skull or lead to fits.
- *Vitamin D*: The market is flooded with different formulations (drops or syrups) with varying strengths. Parents are likely to get confused between them or between one trade name and another with a different strength. Besides, media has propagated vitamin D as a magic medicine which cures all and never harms. Excess vitamin D can accumulate in the body and can lead to urinary stones and cause serious damage to the kidney and sometimes the heart.
- *Iron*: A toddler can accidentally chew some sweet, coated iron tablets prescribed for an adult in the family, leading to overdose and serious consequences; sometimes it can even be fatal.
- Excess of sodium (salt) can contribute to high blood pressure.
- Vitamins B complex and C do not accumulate in the body and usually do not cause any harm, if consumed in excess.