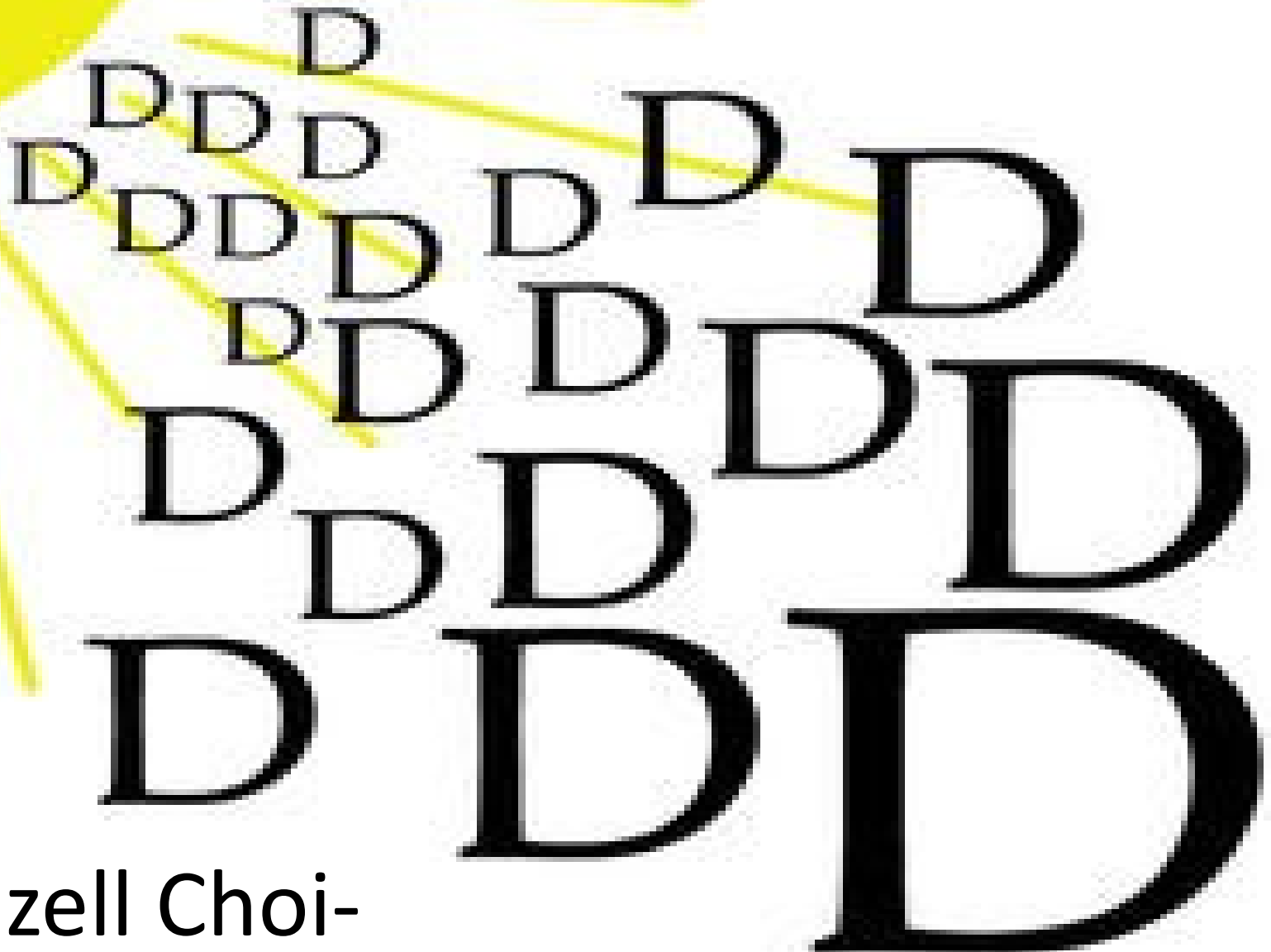


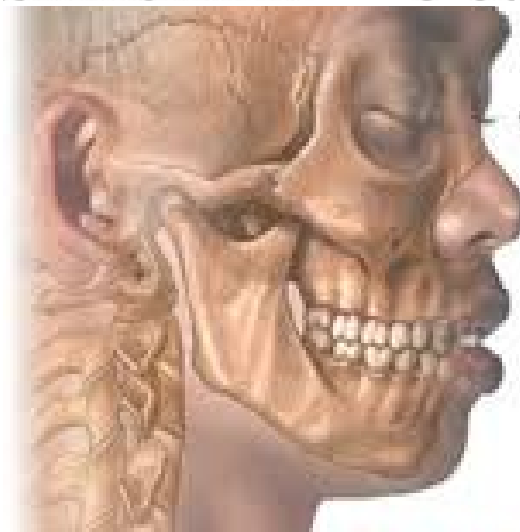
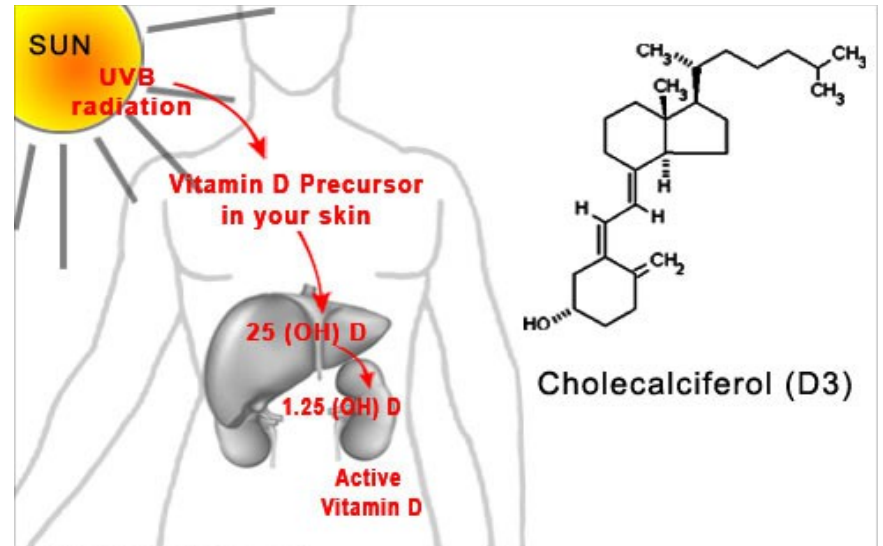
# Vitamin D



By Jazell Choi-

# What is Vitamin D

Vitamin D is a hormone, similar to a steroid which is commonly deemed as a fat-soluble vitamin. Known as the “sunlight vitamin”, the body naturally produces the vitamin with the assimilation of ultraviolet rays of sunlight. The vitamin nutrient obtained from sunlight, foods or supplements requires synthesis through the liver and kidneys before the body can convert it to usable Vitamin D. Vitamin D is necessary for the absorption of calcium. Without Vitamin D the body cannot utilize calcium obtained from foods. Both nutrients are essential for bone growth, health and aging.



Vitamin D promotes the body's absorption of calcium, essential to development of healthy bones and teeth

RDA:  
600 iu for adults  
younger than age 70  
800 iu above age 70  
(iu = international units)

# Recommended Dietary Allowances

## Dietary Reference Intakes for Calcium and Vitamin D

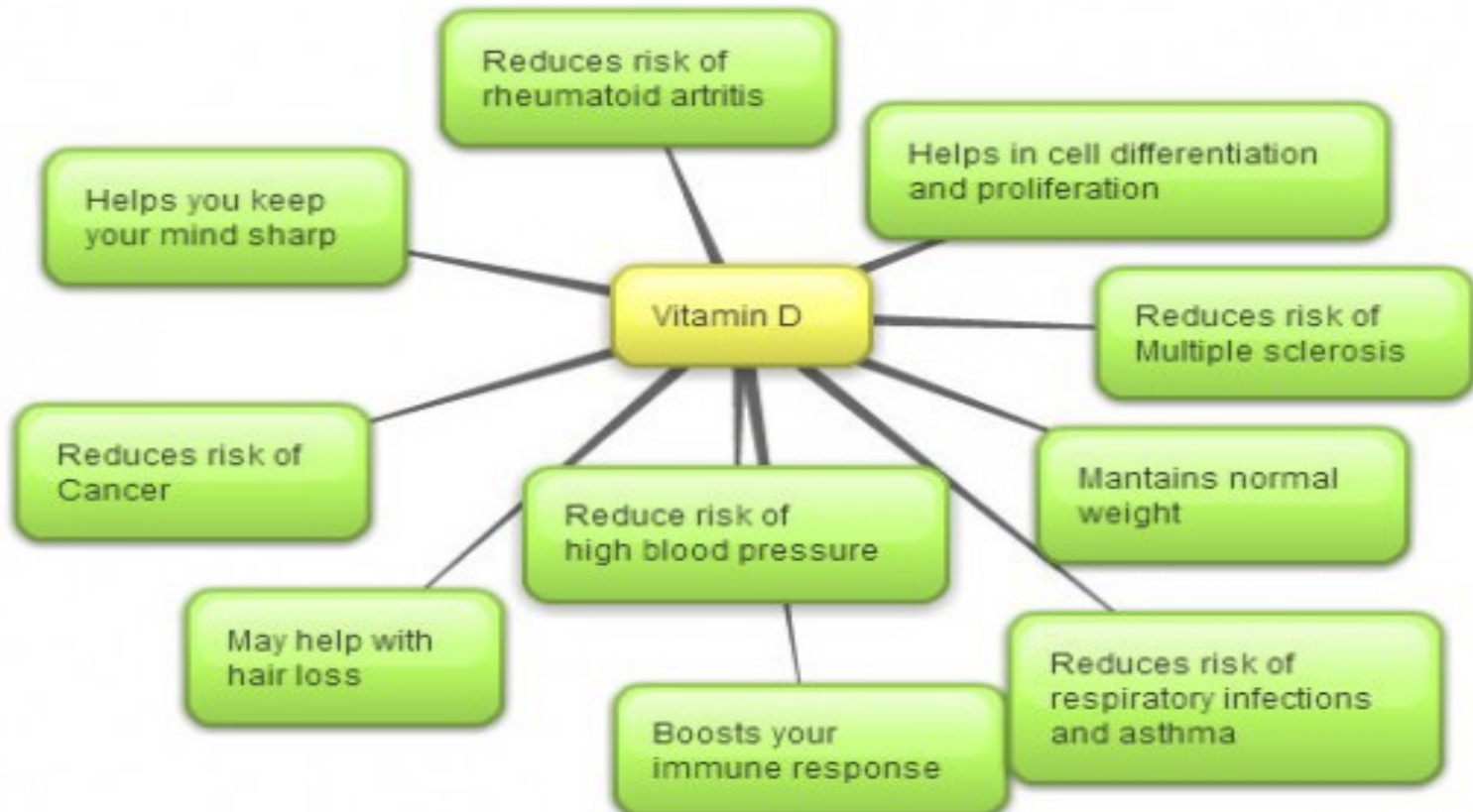
Life Stage Group	Calcium			Vitamin D		
	Estimated Average Requirement (mg/day)	Recommended Dietary Allowance (mg/day)	Upper Level Intake (mg/day)	Estimated Average Requirement (IU/day)	Recommended Dietary Allowance (IU/day)	Upper Level Intake (IU/day)
<b>Infants 0 to 6 months</b>	*	*	1,000	**	**	1,000
<b>Infants 6 to 12 months</b>	*	*	1,500	**	**	1,500
<b>1-3 years old</b>	500	700	2,500	400	600	2,500
<b>4-8 years old</b>	800	1,000	2,500	400	600	3,000
<b>9-13 years old</b>	1,100	1,300	3,000	400	600	4,000
<b>14-18 years old</b>	1,100	1,300	3,000	400	600	4,000
<b>19-30 years old</b>	800	1,000	2,500	400	600	4,000
<b>31-50 years old</b>	800	1,000	2,500	400	600	4,000
<b>51-70 year old males</b>	800	1,000	2,000	400	600	4,000
<b>51-70 year old females</b>	1,000	1,200	2,000	400	600	4,000
<b>&gt;70 years old</b>	1,000	1,200	2,000	400	800	4,000
<b>14-18 years old, pregnant/lactating</b>	1,100	1,300	3,000	400	600	4,000
<b>19-50 years old, pregnant/lactating</b>	800	1,000	2,500	400	600	4,000

\*For infants, Adequate Intake is 200 mg/day for 0 to 6 months of age and 260 mg/day for 6 to 12 months of age.

\*\*For infants, Adequate Intake is 400 IU/day for 0 to 6 months of age and 400 IU/day for 6 to 12 months of age.

# Health Benefits

The body utilizes Vitamin D for roughly 1000 of its genes. The benefits of this vitamin have been proven to prevent: heart disease, stroke, autoimmune diseases, diabetes, depression, arthritis, osteoporosis, gun disease and various types of cancer (Koslo, 2011). Low levels of Vitamin D is commonly diagnosed with people suffering from depression, hypertension, chronic pain and fatigue.



# Symptoms of Deficiency

Vitamin D deficiency is commonly underdiagnosed, and stems from prolonged inadequate sun exposure, poor diet and/or malabsorption. Nutrient insufficiency can also occur if the kidneys or liver have physiological problems with converting Vitamin D. Also, people suffering from cystic fibrosis, celiac, Crohn's and gastrointestinal disease generally cannot properly synthesize Vitamin D (NIH.gov, 2011). Specific diets can also affect Vitamin D levels like lactose intolerance or veganism. Symptoms that signal Vitamin D deficiency are bone pain, muscle weakness, and seasonal affective disorder.

## People with **LOW** levels of Vitamin D have:

- **Higher risk of dying.** Vitamin D has been shown to stave off chronic inflammation linked to virtually every major disease.
- **High blood pressure.** A long term study at Johns Hopkins showed people with inadequate vitamin D had 80% greater chance of narrowing of the arteries — a major risk factor for heart disease.
- **Chronic Pain.** A study conducted in 2008 showed that 25% of people suffering with chronic pain had low levels of vitamin D. Migraines and headaches were also linked.
- **Osteoporosis.** A deficiency of vitamin D makes people more vulnerable to this bone condition because it reduces calcium absorption.
- **Mental decline and depression.** People who don't get enough vitamin D are more susceptible to cognitive decline and low moods.

# Risk Factors for Vitamin D Deficiency

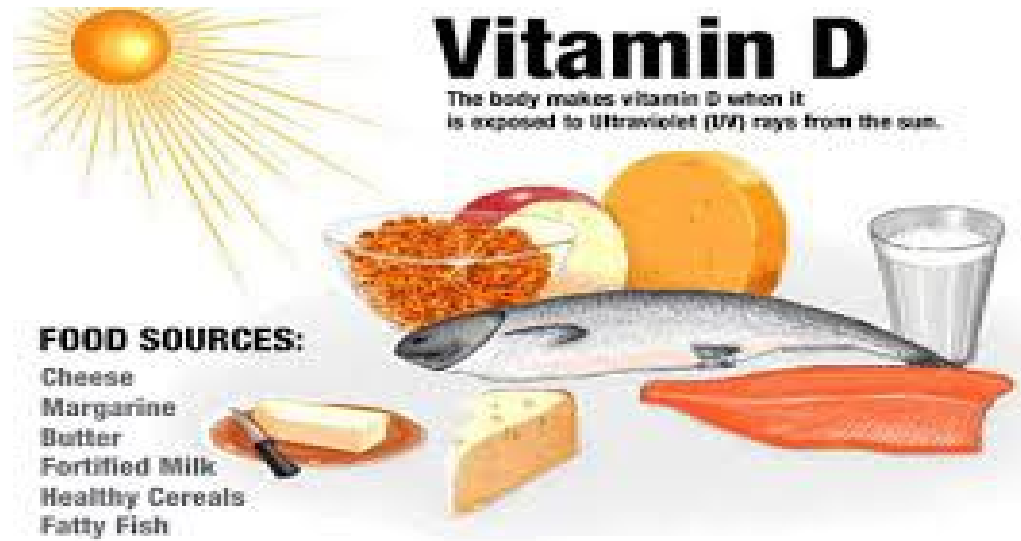






# Sources

The best source of Vitamin D is comes from sunlight. The National Institute of Health suggests that people get 10-15 minutes of sun exposure twice a week, without sunscreen. While few natural foods contain Vitamin D, the nutrients in salmon, tuna, mackerel, seaweed and some mushrooms have substantial levels (The Institute of Medicine). Also, foods like beef liver, egg yolks and some cheeses contain smaller amounts of the nutrient. Other sources of Vitamin D can be found in fortified foods like dairy product (ie. milk, yogurt, butter).



## Vitamin D

The body makes vitamin D when it is exposed to Ultraviolet (UV) rays from the sun.

### FOOD SOURCES:

- Cheese
- Margarine
- Butter
- Fortified Milk
- Healthy Cereals
- Fatty Fish

Vitamin D Source	Vitamin D Content (IU)
Salmon (wild, 3.5 oz)	600-1000
Salmon (farmed, 3.5 oz)	100-250
Tuna (canned, 3.6 oz)	230
Fortified milk (8 fl oz)	100
Fortified orange juice (8 fl oz)	100
Fortified yogurt (8 oz)	100
Fortified breakfast cereal (1 serving)	100
Sunlight: 10 min exposure to arms and legs	3,000



# Food Sources

	Source	Vitamin D content
Natural source	Salmon, fresh, wild (3.5 oz)	About 600-1000 IU of vitamin D3
	Salmon, fresh, farmed (3.5 oz)	About 100-250 IU of vitamin D3 or D2
	Salmon, canned (3.5 oz)	About 300-600 IU of vitamin D3
	Sardines, canned (3.5 oz)	About 300 IU of vitamin D3
	Mackerel, canned (3.5 oz)	About 250 IU of vitamin D3
	Tuna, canned (3.6 oz)	About 230 IU of vitamin D3
	Cod liver oil (1 tsp)	About 400-1000 IU of vitamin D3
	Shiitake mushrooms, fresh (3.5 oz)	About 100 IU of vitamin D2
	Shiitake mushroom, sun-dried (3.5 oz)	About 1600 IU of vitamin D2
	Egg yolk	About 20 IU of vitamin D3 or D2
	Exposure to sunlight, UVB (0.5 MED <sup>†</sup> )	About 3000 IU of vitamin D3
Fortified foods	Fortified butter	About 50 IU/3.5 oz, usually vitamin D3
	Fortified milk	About 100 IU/8 oz, usually vitamin D3
	Fortified orange juice	About 100 IU/8 oz, vitamin D3
	Fortified yogurts	About 100 IU/8 oz, usually vitamin D3
	Infant formulas	About 100 IU/8 oz, vitamin D3
	Fortified margarine	About 430 IU/3.5 oz, usually vitamin D3
	Fortified cheeses	About 100 IU/3 oz, usually vitamin D3
	Fortified breakfast cereals	About 100 IU/serving, usually vitamin D3

\* IU refers to international unit, which equals 25 ng. † About 0.5 MED of UVB radiation would be absorbed after an average of 5 to 10 minutes of exposure (depending on the time of day, season, latitude, and skin sensitivity) of the arms and legs to direct sunlight.



# Who Suffers From Deficiency

People who have little to no sun exposure, and consume foods with little Vitamin D top the list of those who are at the highest risk of deficiency. Also topping the list are infants, as breast milk and infant formulas have very minimal amounts of the vital nutrient. The American Academy of Pediatrics endorses that infants over two months be provided with Vitamin D supplementation (Stoppler, 2011), especially those being strictly breast fed. Supplementation is ideal for infants as prolonged exposure to sun is inadvisable.

Remarkably, those with darker skin color which have high levels of melanin need to spend 3 – 5 times longer times in the sun in order to produce ample level of Vitamin D, as compared with a lighter skinned person (Stoppler, 2011). Other known to suffer from deficiency are the obese, since their body fat tends to extract the vitamin from the blood stream. Lastly, as we age our bodies no longer has the ability to produce Vitamin D efficiently, so seniors are encouraged to supplement.

# Deficiency of New Yorkers

New Yorker's, like most people who suffer from Vitamin D deficiencies do so because of insufficient sunlight, and nutritious foods. It has been theorized that people who live in the colder northern states, which received lower levels of UVB sunrays, experience a higher percentage of deficiencies (Brody, 2010). A common syndrome associated with low Vitamin D levels is Seasonal Affective Disorder (S.A.D.).

S.A.D. is a form of depression experienced provoked by inadequate amounts of sun exposure. Early signs of S.A.D. are said to being in the late autumn and early winter month. Symptoms include: hopelessness, increased appetite, weight gain, loss of concentration, sluggishness, social withdrawal, unhappiness and frequent irritability. S.A.D. is generally treated with Vitamin D supplements and full-spectrum light therapy. Supplementation has been documented to relieve symptoms much more readily than light therapy.

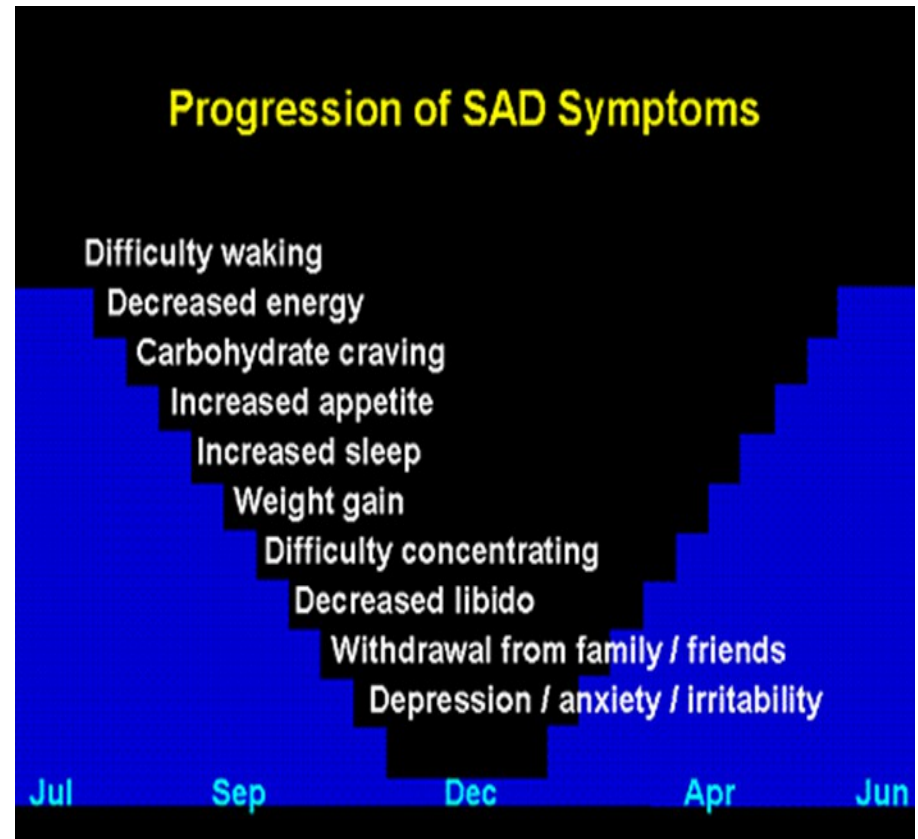


Photo Reference: medicapidaho.com

# Seasonal Affective

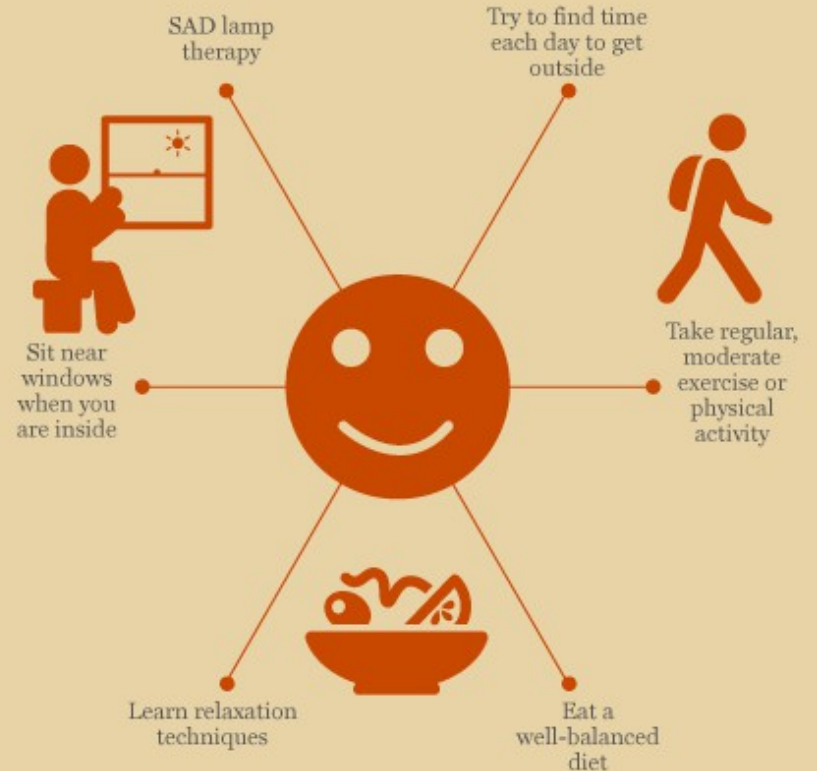
## SYMPTOMS OF SAD

Individual experiences with SAD vary, but there are a few symptoms you can look out for if you are feeling blue:



## TREATMENTS OF SAD

If you are experiencing SAD, or a case of the winter blues, consult with your doctor about the following treatments:



# Conclusion

Vitamin D is a vital nutrient which is readily available by regular exposure to sunlight. Synthesis of calcium is only possible via proper intakes of Vitamin D. This essential vitamin is not only necessary for bone health but also, heart health, the immune system, respiratory system and physiological well-being. Vitamin D deficiency is generally underdiagnosed. However, infants, dark skinned persons, the obese and the aging are more susceptible to deficiencies than most. Deficiency can be avoided by eating foods known to Vitamin D like fish, seaweed and mushrooms.

New Yorker's who are diagnosed with Vitamin D deficiency, generally suffer from seasonal affective disorder (S.A.D.). The primary symptoms of S.A.D. are depression, weight gain and fatigue. Treatment of deficiency includes supplementation, full-spectrum light therapy, Vitamin D supplements and a high Vitamin D diet. Nonetheless, the key to avoiding deficiency is spending less time in front of the television and computer, and more time in the sunlight.

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