

# Why You Need More Vitamin D

## Every cell in your body uses vitamin D

It has been discovered that there are **vitamin D receptors all over the body**, so it has **an effect on every system in our body** and will perform a different job in each of these systems. Vitamin D acts as a protector and regulator so it is able to enhance the functioning of that system and defend against disease.

Many cells in our body require vitamin D to function properly.

### Brain



#### Vitamin D functions in the brain:

- Brain development – stimulates neural cell growth and maturation
- Protects neural cells from damage
- Plays a role in production of neurotransmitters (dopamine, serotonin, acetylcholine, catecholamine)

#### Disease associated with low vitamin D:

- Alzheimer's Disease & Dementia
- Cognitive decline
- Parkinson's disease
- Depression/Anxiety/Seasonal Affective Disorder
- Schizophrenia
- Autism
- Migraines
- Multiple sclerosis
- Macular degeneration

### Dermatological



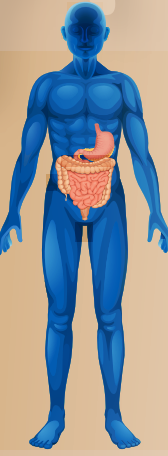
#### Vitamin D and the skin:

- Vitamin D synthesis begins in the skin exposed to the sun (UVB rays)
- Important for normal hair, skin and nail growth
- Protects excessive cell proliferation (e.g. skin cancer or psoriasis)

#### Disease associated with low vitamin D

- Psoriasis
- Skin Cancer
- Skin infections such as Staphylococcus aureus
- Raynaud's syndrome

### Gastrointestinal



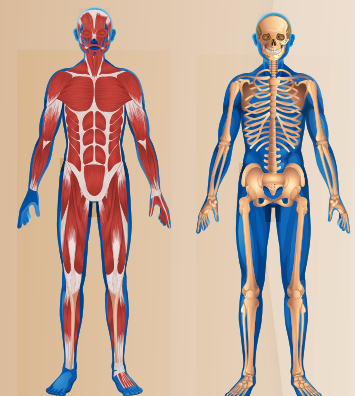
#### Vitamin D and the gut:

- Important for calcium absorption
- Important for absorption of magnesium, phosphate, iron and zinc
- Protects the gut by influencing immune cell function

#### Disease associated with low vitamin D:

- Non alcoholic fatty liver disease
- Inflammatory Bowel Disease (IBD)
- Crohn's disease
- Ulcerative colitis

### Musculoskeletal



#### Vitamin D and the gut:

- Influences calcium and magnesium concentrations – both important for muscle and bone
- Directly stimulates bone mineralization
- Improves skeletal muscle function and normal coordination

#### Disease associated with low vitamin D:

- Rickets, osteomalacia, osteoporosis, falls, fractures, and premature mortality
- Neuromuscular disease
- Muscle weakness
- Chronic pain

### Respiratory System



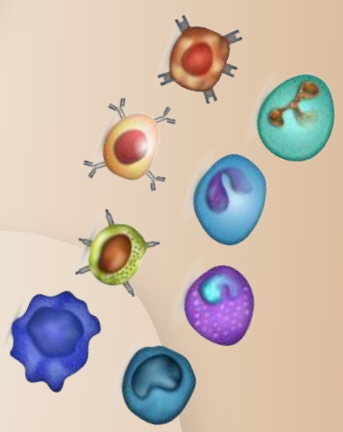
#### Disease associated with low vitamin D:

- The "Common Cold"
- Infectious mononucleosis
- Influenza
- Pneumonia
- Active Tuberculosis

#### Vitamin D and respiration:

- Important for protection against infection
- Important for immune cell function (white blood cells) in the throat, airways and lungs

### Immune System



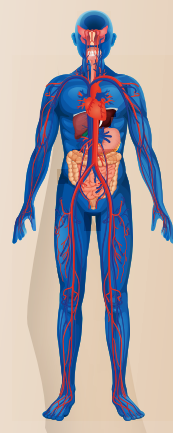
#### Disease associated with low vitamin D:

- The "Common Cold"
- Leukemia
- Multiple Myeloma
- Urinary tract infections
- Allergies
- Asthma
- Respiratory tract infections

#### Vitamin D and the immune system:

- Regulates the activity of many immune cells including macrophages, monocytes, B-cells, T-cells
- Important for regulation of inflammation, allergies and asthma

### Endocrine



#### Disease associated with low vitamin D:

- Insulin resistance
- Type I, Type II and Gestational Diabetes
- Diabetic Neuropathy, Retinopathy, Nephropathy
- Secondary Hyperparathyroidism

#### Vitamin D and its impact on hormones:

- Regulates blood sugar
- Important for insulin production

### Reproductive System

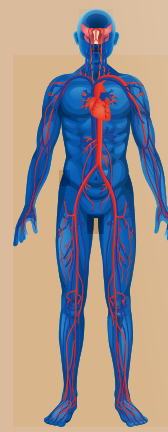
#### Vitamin D and reproduction:

- Regulates hormonal pathways, follicular development, fertility
- Important for sperm production
- Important for normal fetal development

#### Disease associated with low vitamin D:

- Mastitis
- Polycystic ovarian syndrome
- Fibroids and endometriosis
- Pre-eclampsia
- Bacterial vaginosis

### Cardiovascular System



Vitamin D has a direct effect on vascular cells and plays a role in normalizing blood pressure, blood sugar, calcifications, and smooth muscle function.

#### Vitamin D and the heart:

- Regulates blood pressure
- Important for renin-angiotensin-aldosterone system
- Protects against oxidative damage and atherosclerosis
- Important for smooth muscle function (vascular pathways)

#### Disease associated with low vitamin D:

- Hyperlipidemia
- Hypertension
- Atherosclerosis
- Peripheral artery disease
- Congestive Heart Failure
- Chronic Kidney Disease

## Vitamin D and Cancer

#### Vitamin D anti-cancer properties:

- Inhibits cancer cell growth
- Stimulates maturation of cells
- Induces death of cancer cells
- Prevents blood vessel growth in tumors

#### Cancers associated with low vitamin D:

- Colorectal cancer
- Breast cancer
- Prostate cancer
- Lung cancer