

SILICON (Si)

General - trace element;

- Adult body contains about 20 mg;
- Silicon is sister element of carbon, but atoms are bigger & less electronegative; forms stronger bonds than carbon; structural stability;
- **History:** found in ashes of animals in 1848; found in tendons, aponeuroses & eye tissues in 1901; anti-atheroma function suggested in 1911; essentiality for humans established in 1972;

Nutrition

- **Sources:** best: rice polishings, whole grains, brans, horsetail herb, root vegetables, alfalfa; good: skin; poor: most other foods, refined foods (98% of silicon is removed);
- **Supplements:** bamboo extract, horsetail herb, oat straw tea, alginic acid, pectin, kelp, comfrey, nettles;
- **Absorption:** from intestinal tract; absorption rate depends on kind of silicon compound;
- **Antagonized by:** molybdenum, magnesium, fluoride, high fibre;
- **Storage:** high concentrations of silicon in lymph nodes as clusters & grains of quartz; in skin, aorta, tendons, epithelial & connective tissue; in active growth areas of bones; in skin & fingernails;
- **Excretion:** through urine;
- **Metabolism:** silicon excretion affected by hormones; evidence that parathyroid hormone regulates blood silicon levels;

Functions of Silicon

- Functions as a cross-linking agent, providing strength and resilience to collagen & elastin connective tissues;
- Likely essential for bone & cartilage collagen synthesis;
- Present as silanolate, ether or ester-like silicic acid derivative, in mucopolysaccharides, the structural components of connective tissues; may play role in structural organization of mucopolysaccharides;
- Chondroitin sulphate contains high level of silicon;
- Silicon appears essential for bone calcification;
- 14x as much silicon in clean arteries than in arteries with atherosclerosis;
- Fibres which benefit heart & arteries all contain high quantities of silicon;
- Stimulates growth;

Quantities

- **Measurement:** in milligrams;
- **Optimum: (SONA)** average ranges not yet set; suggested intake may be 40 to 100 mg/day;
- **Individual optimum** needs to be determined for each individual case;
- **Minimum: (DRI)** not yet established
- **Less than RDA:** no official figures; estimated around 30% of population; those eating refined diets & diets low in whole grains & root vegetables;
- **Deficiency** from refined foods diets;
- **Symptoms** of silicon deficiency have not been definitely identified for humans, but may include atherosclerosis, osteoarthritis, high blood pressure and premature ageing;
- May include tissue weakness, ageing, joint & cartilage weakness, connective tissue weakness; bone weakness;
- **Toxicity:** oral silicon is non-toxic;

Therapy with Silicon

- May prevent atherosclerosis, arthritis, ageing of connective tissues & skin;
- May strengthen musculo-skeletal system, preventing injuries in athletes & others;
- May be useful in treatment of disorders involving connective tissues, bones & skin;
- May be helpful in growing healthy hair & nails;
- May be useful in reducing blood fats & cholesterol; Silicon may form insoluble complexes with bile in intestine, ensuring its removal from body;
- May help heal gastric ulcers and arthritis (connective tissue healing);
- May help re-calcify bones & decalcify soft tissue deposits of calcium;
- May help bones heal & help prevent osteoporosis;
- **Synergists:** N-acetyl glucosamine, manganese, vitamin C, calcium;