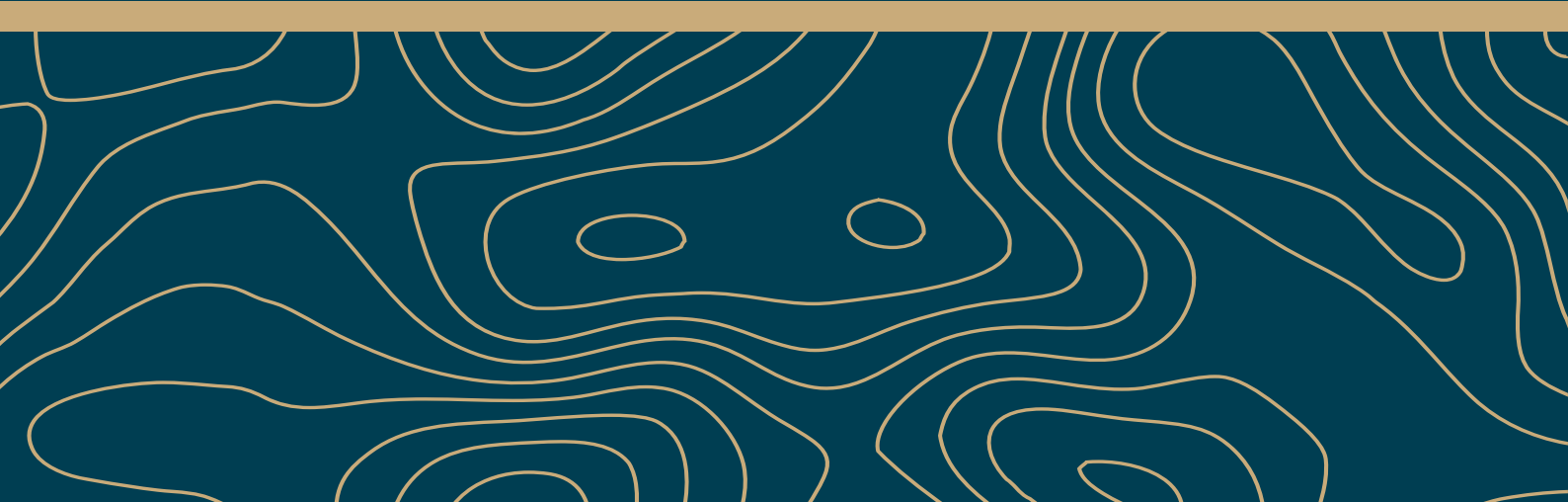
MARAH NATURAL

SAC FORMULATION TECHNOLOGY



SAC in a Nutshell

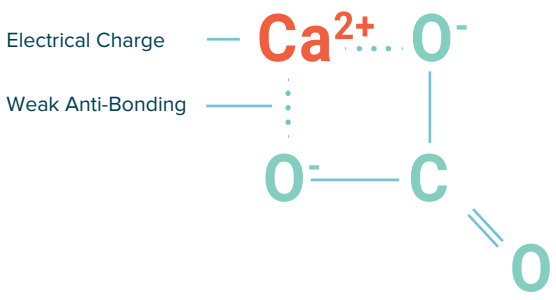
SAC (Sigma Antibonding Calcium Carbonate) is the only true ionic calcium delivery system that provides calcium in free ionic state, which is the only physiologically active form of calcium in our body. Normally, calcium from diet and supplements enters our body in the protein-bound form and therefore, cannot trigger the same physiological responses as SAC. Resolving calcium deficiency better than protein-bound calcium, SAC triggers ionic-calcium-sensitive physiological responses that counteract the root cause of diseases and brings natural healing reactions of our body from cellular to the systemic level.

The Invention of New Calcium Carbonate

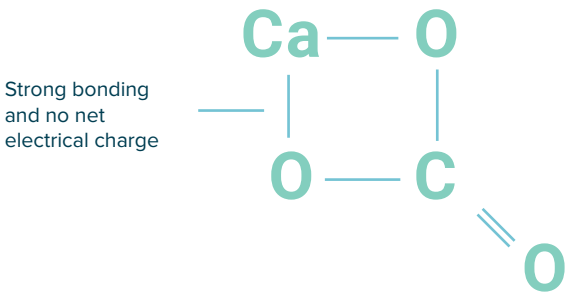
Sigma Anti-bonding Calcium Carbonate (SAC-CaCO3)

SAC is the world's first calcium-ion-delivery-system, which safely and effectively elevates the level of calcium-ion concentration in our blood. By utilizing a very weak chemical bonding, namely sigma antibonding, to calcium carbonate molecules, Calcium & Bone Health Institute of Canada (CBHI) invented new calcium carbonate, which maintains loosely held calcium ion to its carbonate group. The antibonding makes the molecules exhibit electrical charge and attract water molecules via hydrogen bonding. Making sigma antibonding stable at room temperature was, in itself, a technological breakthrough after ten years of R&D.

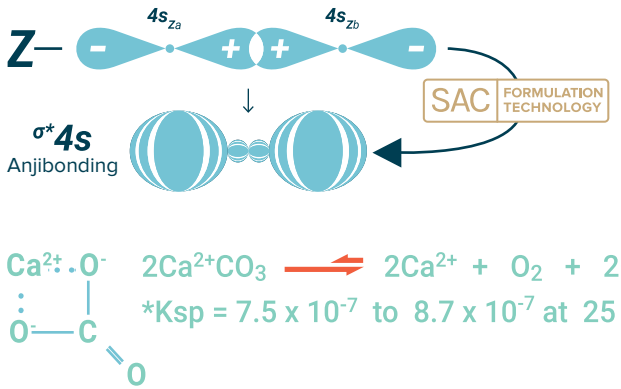
SAC CALCIUM CARBONATE



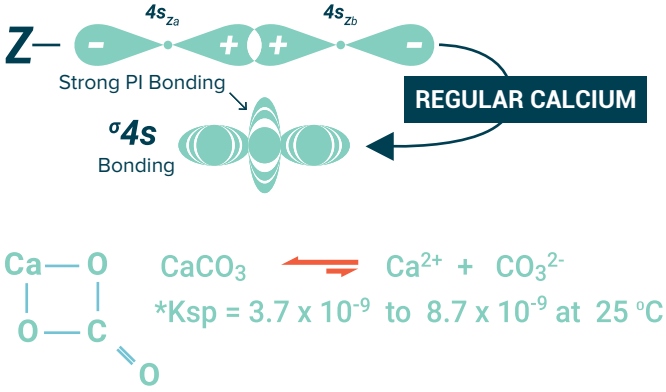
REGULAR CALCIUM CARBONATE



SAC CALCIUM CARBONATE



REGULAR CALCIUM CARBONATE



Because of the weak chemical bonding of SAC, calcium ion is easily detached and passively absorbed into our system through stomach lining as ions via diffusion and osmotic pressure, not requiring digestion, vitamin D, nor peptides for absorption. This is called passive transport.

Because of our body's natural sensitivity to fluctuations of serum plasma ionic calcium level, a minimal elevation of ionic calcium concentration achieved by SAC can trigger hormonal responses, such as the release of TSH and calcitonin to trigger bone-building osteoblasts. SAC utilizes ionic calcium as a signaling agent to trigger our body's self-healing responses to reverse calcification from cellular to systemic level, causing domino effects of healing processes to rebuild our health. SAC's healing pathway is genuinely unique.

SAC CALCIUM CARBONATE

Stomach

No Digestion Needed.
Absorbed via Diffusion &
Osmotic Pressure

Ionic Calcium

Activates Inactive
Protein-calcium
for better calcium
utilization

REGULAR CALCIUM CARBONATE

Stomach

Digestion Needed.
Peptides & Vit D3 Required

Protein Calcium

Inactive Calcium that
needs to be activated
for use

"SAC is the world's first safe calcium-ion delivery system administered directly into our body in oral form. SAC triggers healing mechanisms no other calcium supplementation can achieve"

What is Sigma Anti-bonding?

Anti-bonding orbitals are essentially the “opposite” of bonding orbitals. They are formed when atomic orbitals combine in ways that lead to predominantly destructive interference.

The key feature of anti-bonding orbitals is that the molecular orbitals have a higher energy than the corresponding atomic orbitals. Thus, the molecule has a higher energy than the separated atoms (atoms separated by a large distance) and the atoms would prefer to be in the lower atomic state.

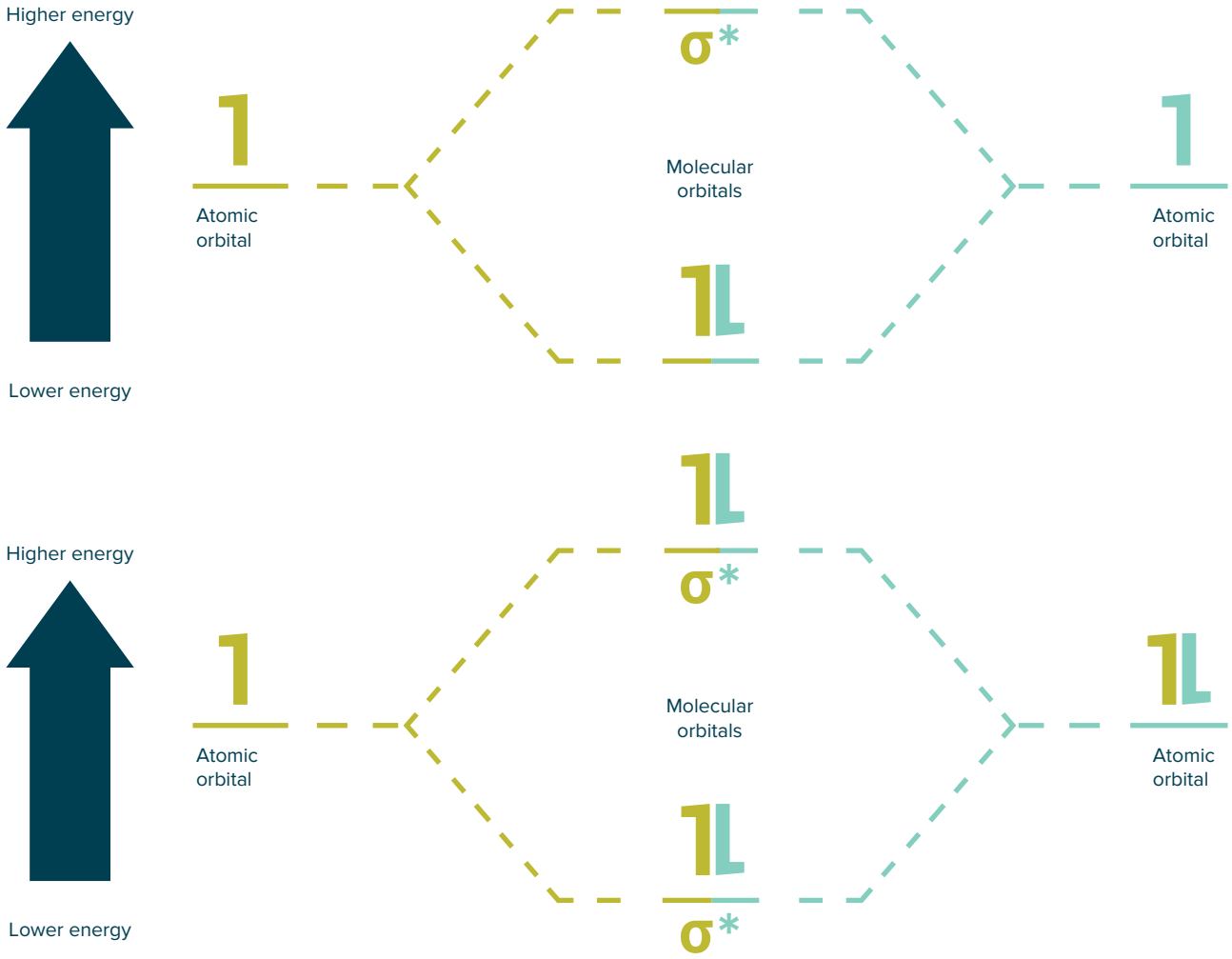
Anytime two atomic orbitals combine to give a lower-energy bonding orbital, an analogous higher energy anti-bonding orbital is also formed. Below is a figure depicting this simple bond/anti-bond molecular orbital diagram that we had for hydrogen. The diagram also shows that electrons (in this case) completely fill the bonding orbital and leave the anti-bonding orbital empty.

S-ORBITALS

Destructive Interference
(out of phase)

σ* antibonding orbital

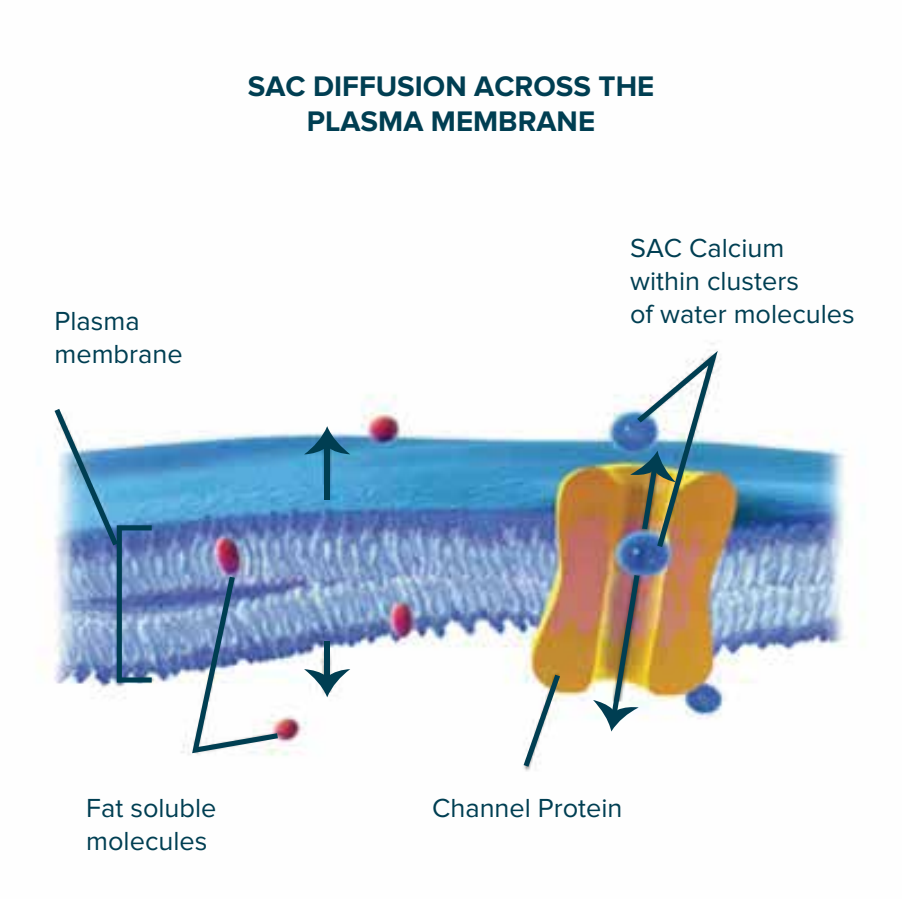
SAC calcium's sigma anti-bonding keeps the calcium atoms in the molecule very loose and unstable. Our innovative technology locks calcium atoms in place until it is released in our body.



SAC Diffusion Across the Plasma Membrane

SAC Calcium is an innovative new bio-material based on calcium carbonate derived from small oyster shells. Highly advanced process formulates it to maintain positive charges (2+) by altering the bonding structure, namely sigma anti-bonding. The positive charges of the molecule attract water molecules to cluster around it, making it incredibly water soluble and allowing direct and passive absorption into the body.

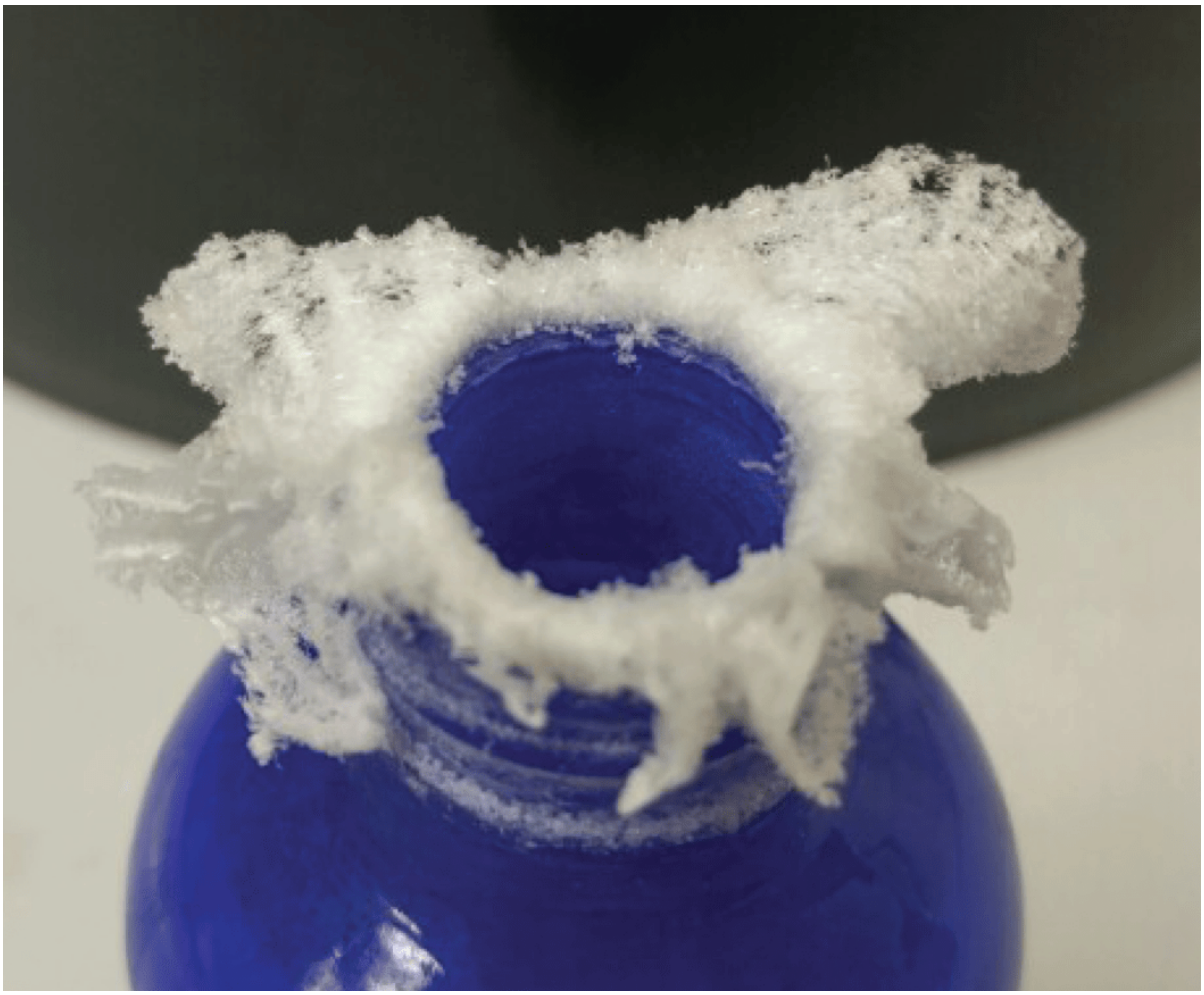
SAC Calcium is directly absorbed because of its anti-bonding positive charge, and is immediately bio-available. SAC bypasses active transport delivery that requires digestion with peptides and vitamin D, a complicated process that leaves absorbed calcium far less bio-available.



Unique Physical Properties of SAC Calcium

Because of electrical charge of SAC calcium cabonate molecule that interacts with hydrogen bonding of water molecules, an open bottle of SAC evaporates calcium together with water molecules and crystalize with CO2 in the air.

SAC is 200x more soluable in water compared to calcium carbonate and 3x more reactive in chemical reaction.

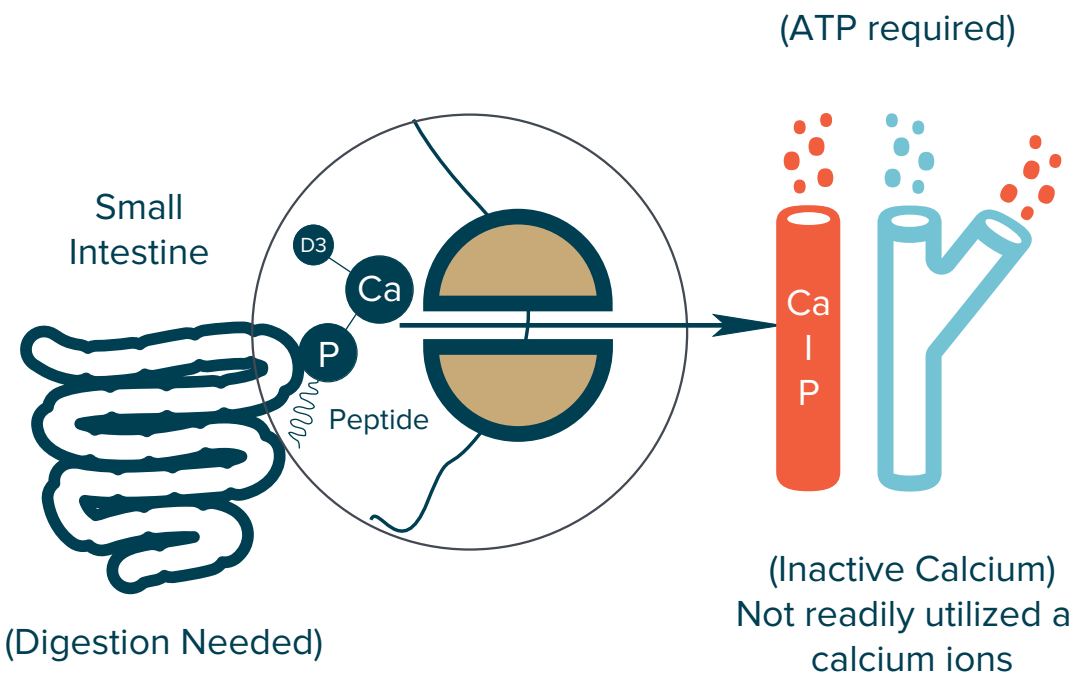


Unique Passive Absorption of SAC

Active Transport of Regular Calcium

Regular calcium intake from diet or supplements need strong stomach acid with peptides and vitamin D3 to digest and be absorbed in small intestines as protein-bound calcium, which is not readily utilized with aging because of sedentary lifestyle, hormonal changes, and poor diet. Various side effects of inactive calcium include kidney stones, blood vessel calcification, stroke, heart attack, etc. Most, if not all, calcium supplements fall in this category and may aggrevate body-wide calcification which is known to be one of many major cause of degenerative diseases.

TYPICAL CALCIUM ABSORPTION AS PROTEIN-BOUND CALCIUM
(Requires vitamin D and peptides)



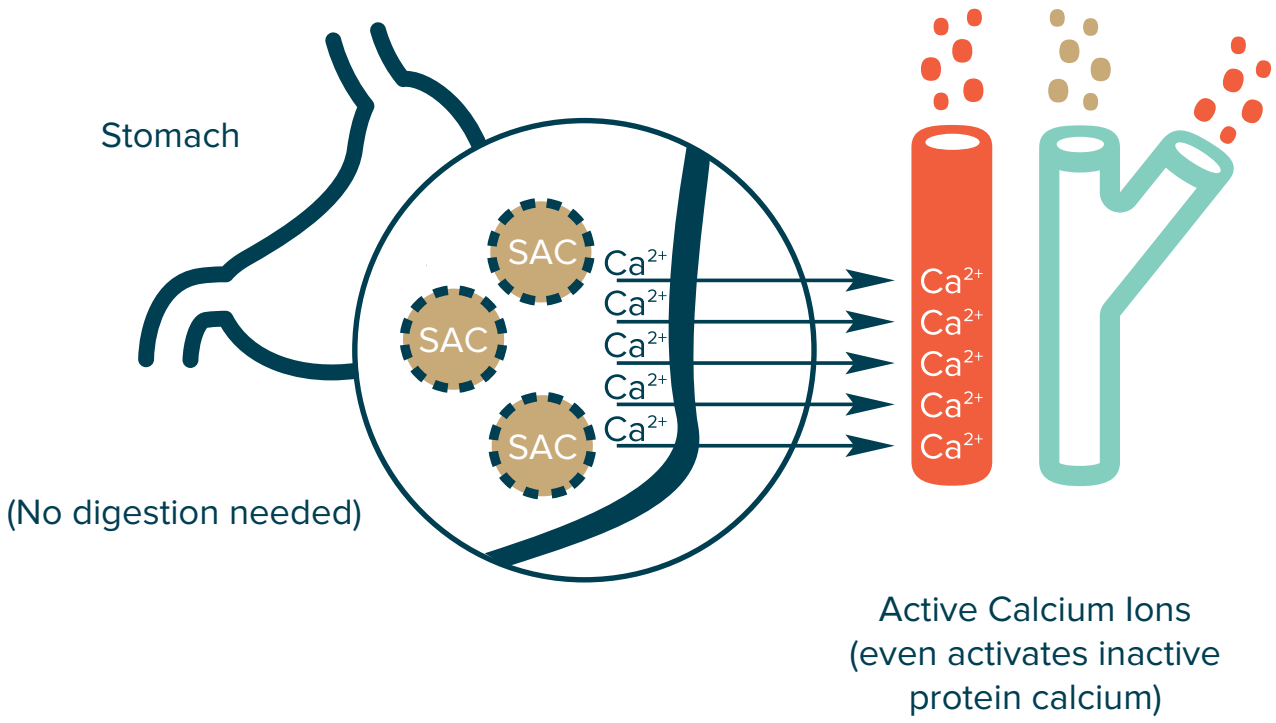
Passive Transport of SAC Calcium

Unlike regular calcium intake, no Vitamin D3 and peptides are needed for absorption. SAC diffuses passively through digestive tract cell linings (mucosa) as ions, not requiring physiological energy from our body and readily available for immediate use.

Ionic calcium is immediately utilized to bring calcium homeostasis :

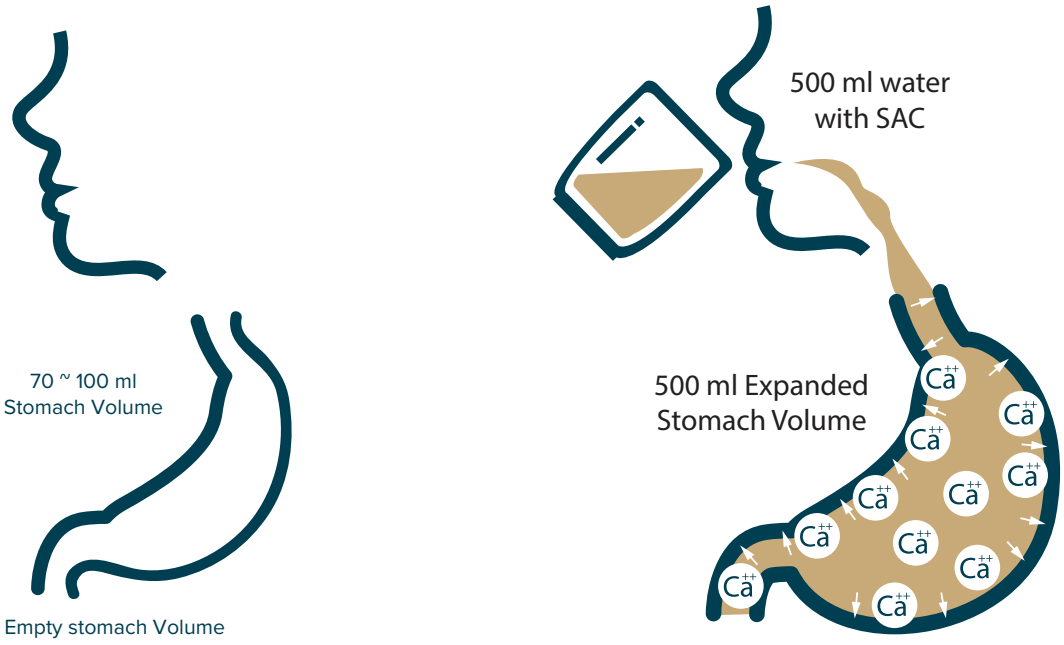
- Corrects calcium signaling
- Reduces cellular oxidative stress
- Restores mitochondrial function
- Triggers decalcification

PASSIVE TRANSPORT (DIRECT ABSORPTION WITH WATER)



SAC is Absorbed through Diffusion & Osmotic Pressure

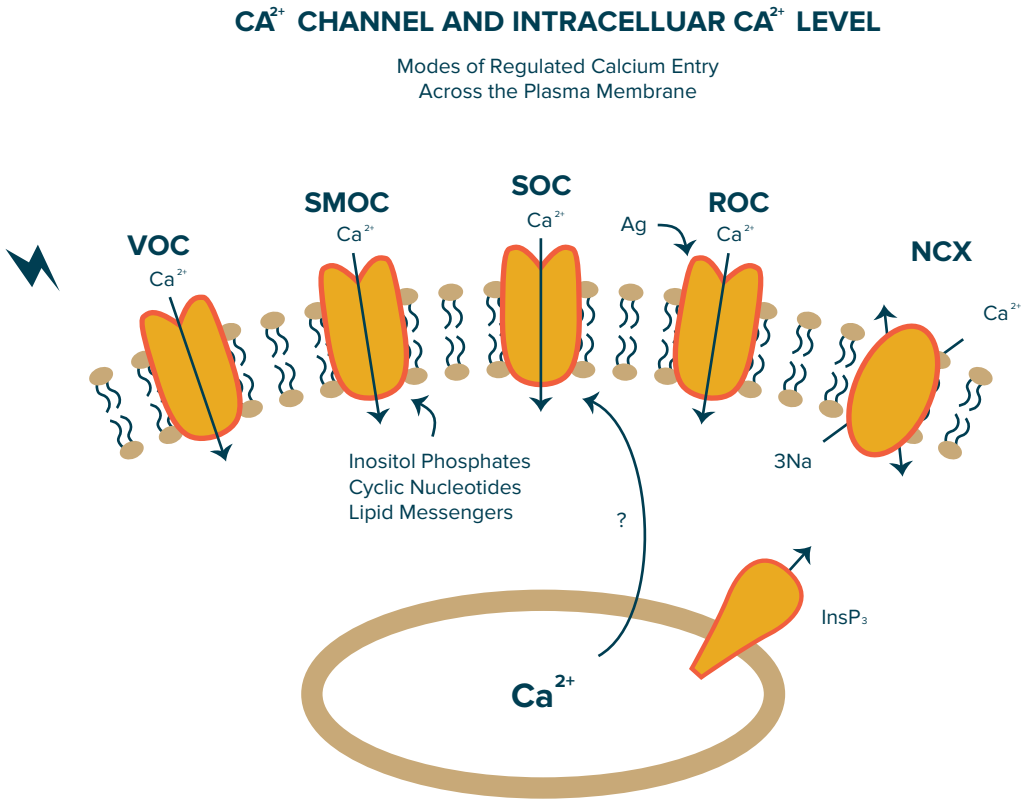
About 5 to 7.6 mg of SAC solution is mixed with 500ml of water for optimun absorption as ionic calcium. SAC is takin in an empty stomach and is completely absorbed within 30 minutes through diffusion and osmotic pressure. Although it is in a small intake amount, slight elevation of ionic calcium in the blood is enough to trigger TSH (thyroid stimulating hormone) to initiate strong bone-building osteoblasts. SAC's cascading effects on physiological functions of our body also activate inactive protein-bound calcium in our blood to further boost and maintain good bone health.



SAC is the First Calcium-ion-delivery-system

SAC can help build and support strong bones while promoting normal bone mass. SAC also plays an important role in other functions such as nerve transmission and muscular function. Unlike other electrically neutral calcium supplements that require Active Transport, SAC calcium's Passive Transport brings full absorption of calcium without the need for Vitamin D, peptide, or other agents.

Inside our cells, SAC calcium quickly breaks down to yield calcium ions, which are absorbed into capillaries and triggers our body's natural bone formation process.



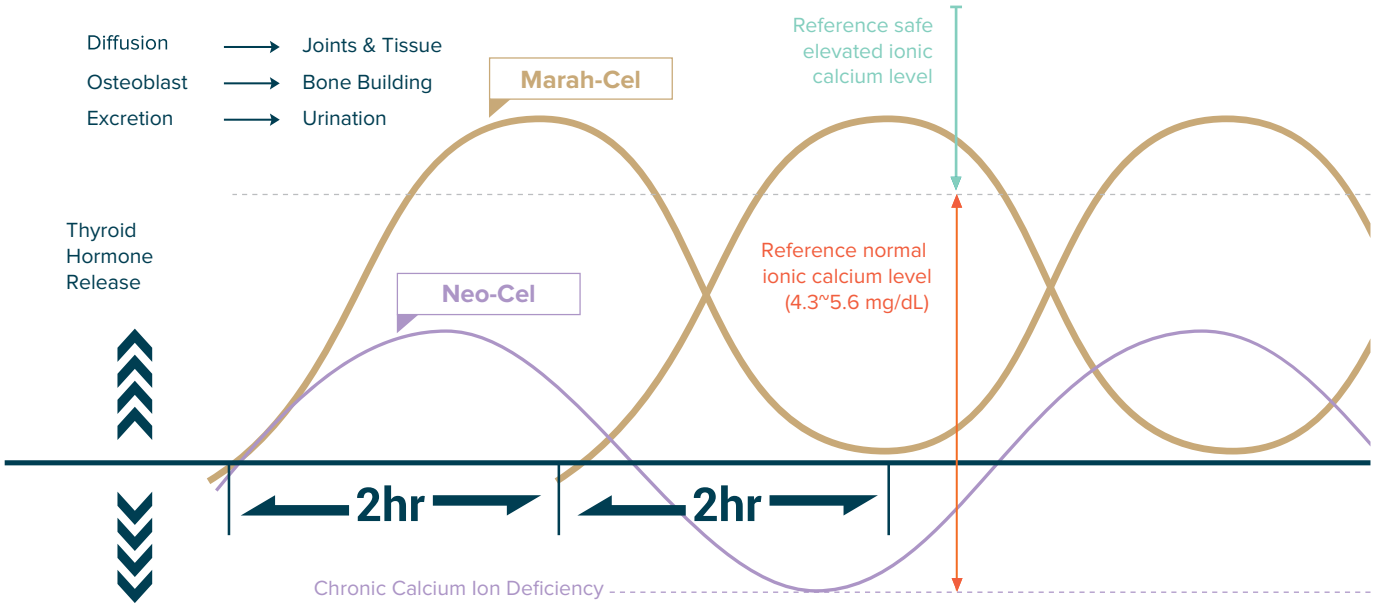
- 100nM Ca in intracellular

- 100nM - 10000nM during cellular functions

Physiological Effects of SAC

After intake, SAC's effect lasts about four hours in our body, initially raising the serum ionic calcium concentration to a higher yet safe level to trigger various physiological functions before bringing down the serum ionic calcium concentration down to the average physiological level.

While ionic calcium level is elevated, bone-building osteoblast with osteoclastic activity is triggered to raise the bone turnover rate, repairing and rebuilding bones. This process also activates idle protein-bound calcium, releasing both ionic calcium and protein, further fueling bone-building and clearing body-wide calcification. Ionic calcium also aids cellular metabolism, releasing more ATP (adenosine triphosphate) and raising body temperature. As kidneys try to excrete excess ionic calcium through urination, an urge to urinate within an hour of taking SAC is experienced, which is both healthy and normal, indicating that SAC is working.



"A long term, follow up study done in Denmark for 35,000 people revealed that the people with strong bones in their 50's lived 11.6 years longer.

YET, in Canada, 49% of infants are born with calcium deficiency. Only 70% recover after breastfeeding. Calcium deficiency during pregnancy and infancy leads to serious health issues."

Bone Loss Leads to 150+ Degenerative Diseases

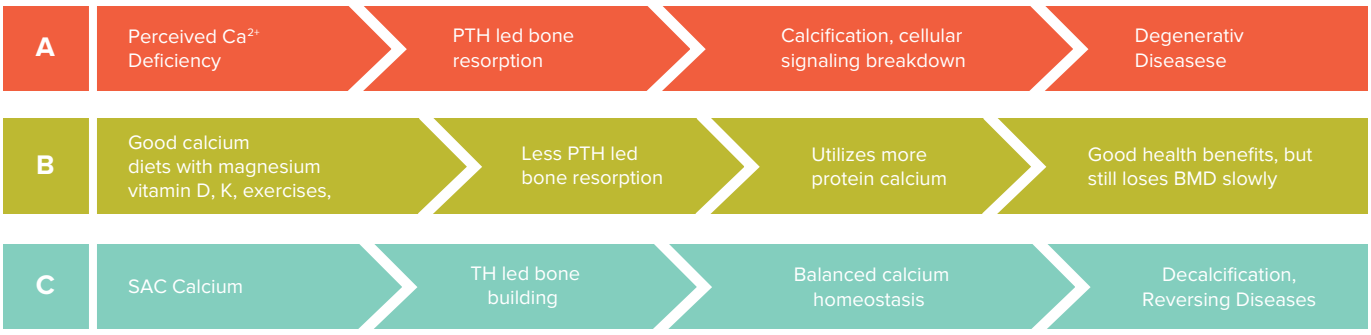
Bone health is directly related to our overall health. Emptier bone characterized by osteoporosis or osteopenia indicates not only a higher risk of fracture but also a greater chance of developing degenerative diseases. Why? Because emptying bones cause calcification in both cellular and systemic levels, causing cellular communications mayhem by disrupting calcium signaling.

BONE LOSS FROM AGE ~35 » **CELLULAR CALCIFICATION** » **DEGENERATIVE DISEASES**

Bone density reaches a peak around age 30 and starts to decrease around age 35. Women with menopause have a sharper decline than men, posing a higher risk of osteoporosis. Stress, a sedentary lifestyle, sedentary lifestyle, and toxins accelerate the drop.

Mitochondrial Dysfunction
Cellular Infiammation
Oxidative Stress
Calcium Signaling Breakdown

Chronic Inflammation
Autoimmune Response



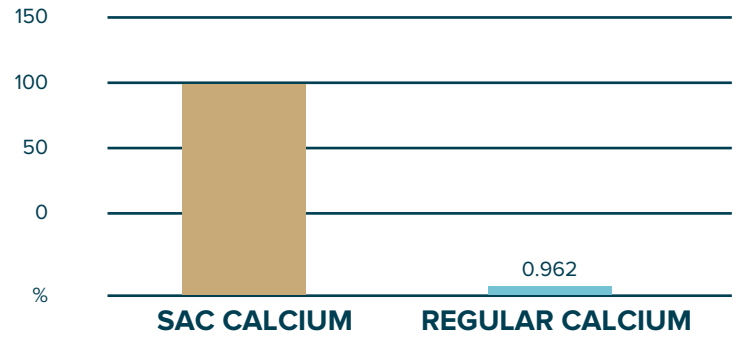
CATEGORY A Most people fall under this category. With aging, parathyroid hormone (PTH) becomes more active and takes out more calcium ion from bones than needed and causes weaker bones and whole body calcification.

CATEGORY B More health-conscious people. Slow aging with a healthy diet and bone-challenging exercises that keeps bones strong, leading to less calcification. The onset of calcium-related degenerative diseases is delayed.

CATEGORY C With SAC, thyroid hormone (TH) led bone-building restores calcium homeostasis and leads to whole body decalcification, which helps to reverse calcium-related degenerative diseases.

Promising Animal Clinical Trials

BONE MINERAL DENSITY (BMD) | 1 ppm taken daily for 9 weeks



CLINICAL TRIAL RESULT

	Dose Conc.	BMD*
SAC Calcium	0.0001%	102.2
Regular Calcium	0.01%	96.2

Calcium ions in the blood are so vital that the body cannot permit it to fluctuate. Therefore, even a slight increase in the concentration of ionized calcium in the blood triggers the bone building process to take excess calcium into bones. Utilizing this process is by far the most effective and safe way to support strong bones since it follows the body's natural bone building mechanism. This amazing effect of SAC was observed in this animal clinical trial through the bone break test where SAC 'treated' bone displayed almost 100x bone building power compared to regular calcium carbonate.

Importance of SAC goes beyond the stronger bone-building. Although most of our body's calcium is stored in bone, the tiny amount that circulates in your bloodstream is disproportionately vital to good health. About half of this circulating serum calcium (50%) is "ionized", which means it carries electrical charges and this calcium ions (Ca2+) are the only physiologically active form that can be recognized by our body and responsible for numerous functions of our body such as the firing of muscle and nerve cells, promoting blood clotting, preventing the depletion of bone mass, securing proper cellular functions by preserving calcium signaling, etc. As we age, this vital ionic calcium homeostasis is disrupted as our bone breaks down and calcifies trillions of cells. SAC can restore this fragile calcium homeostasis and gives our body a chance to fight back the onset of 150+ degenerative diseases that are thought to be caused by calcium displacement.

Osteoporosis Reversed under SAC

(Lab Anim Res 2011: 27(4), 301-307, 2011)

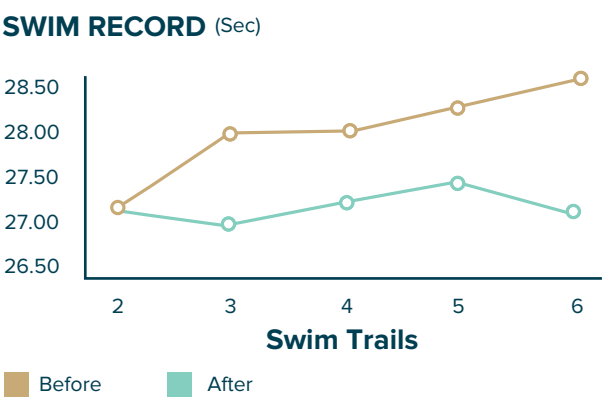
Group	BMD
Sham (Control)	0.2276 ± 0.011 a
OVX (Osteoporosis)	0.1965 ± 0.012 b
OVX + SAC	0.2276 ± 0.012 a

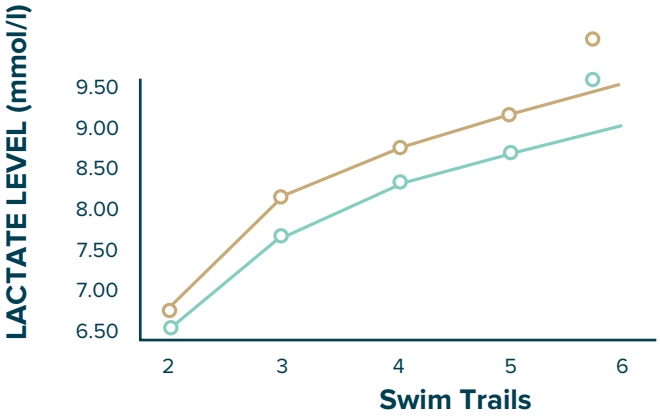
- Control: sham operation
- OVX: no treatment after ovariectomy
- OVX+SAC: SAC treatment after ovariectomy.

The effects of Sigma Anti-bonding Molecule Calcium Carbonate on bone turnover and calcium balance in ovariectomized rats are studied. The study revealed that the induced osteoporosis was completely reversed with SAC. Osteocalcin, estradiol, eosinophil, CTx and BMD level were elevated with SAC, indicating that optimal bone health is indeed restored.

Values are mean ± SD for 5 rats. Means with different superscript letters are significantly different at $p<0.05$ by Duncan's multiple range tests.

Lactic Acid Reduction Clinical Trial (Important Indicator for Effectiveness as a Cancer Treatment)





Twenty swimmers from Korea University swim team taking two doses a day for 14 days proved that SAC neutralizes lactic acid effectively. They all broke their swimming records as a result.

Lactic acid, which is the byproduct of carcinoma cancer cells, is known to inhibit the immune functions around cancer tumors. Neutralizing the lactic acid and bringing pH back to a normal level is crucial in cancer treatment.

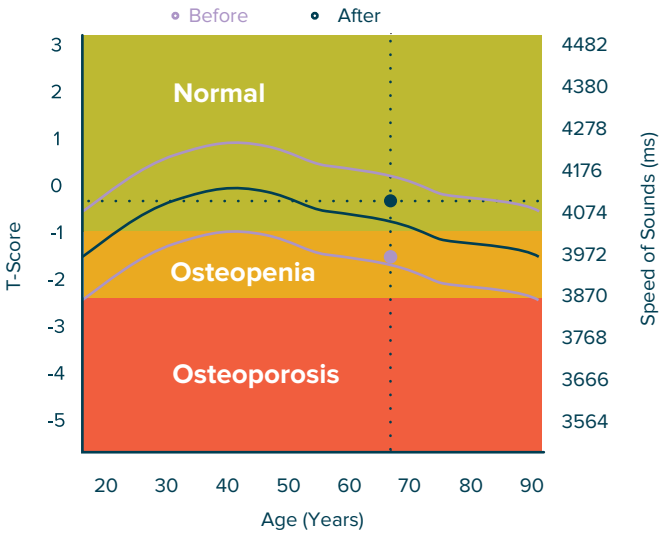
"I have taken Neo-Cel since I was diagnosed with severe osteoporosis with T-score of -3.7. After taking 17 bottles of Neo-Cel, my bone density is back to the normal range. Incredible!!"

M. S. PARK – Age 55, Male

Human Bone Density Clinical Case under SAC (CBHI Canada Conducted BMD Increase Trial for +1000 Patients under SAC)

AGE: 66M

T-Score Increase: 1.4
From osteopenia to normal in 4 months.



04/22/2015 (After)*

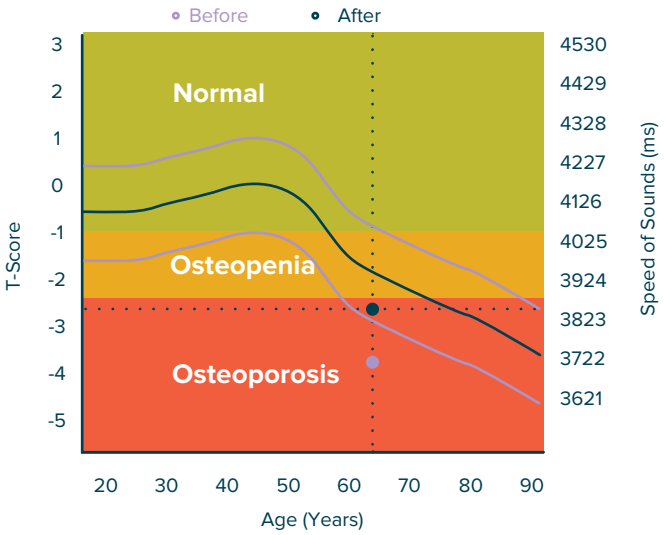
Age: 67 | T- Score: -0.3 | Z-Score: 0.6 | SOS: 4107

12/30/2014 (Before)

Age: 66 | T- Score: -1.7 | Z-Score: 0.8 | SOS: 3947

AGE: 62F

T-Score Increase: 1.2
From severe osteoporosis to osteopenia in 3 months.



04/22/2015 (After)

Age: 63 | T- Score: -2.7 | Z-Score: -0.7 | SOS: 3877

01/23/2015 (Before)

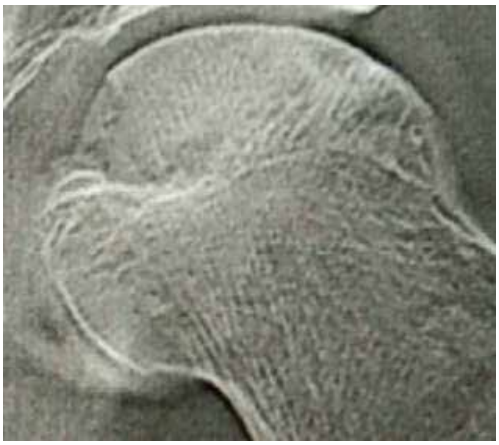
Age: 62| T- Score: -3.9 | Z-Score: -1.9 | SOS: 3740

CBHI (Calcium & Bone Health Institute of Canada) utilized FDA approved ultrasound bone densitometer by BeamMed in measuring and comparing BMD data of more than a thousand patients. Over 90% of the patients experienced increased bone density.

Fracture Healing Effects of SAC

Steroid Induced Osteoporosis, auto fracture (Male, 52, Indonesia)

March 7, 2018



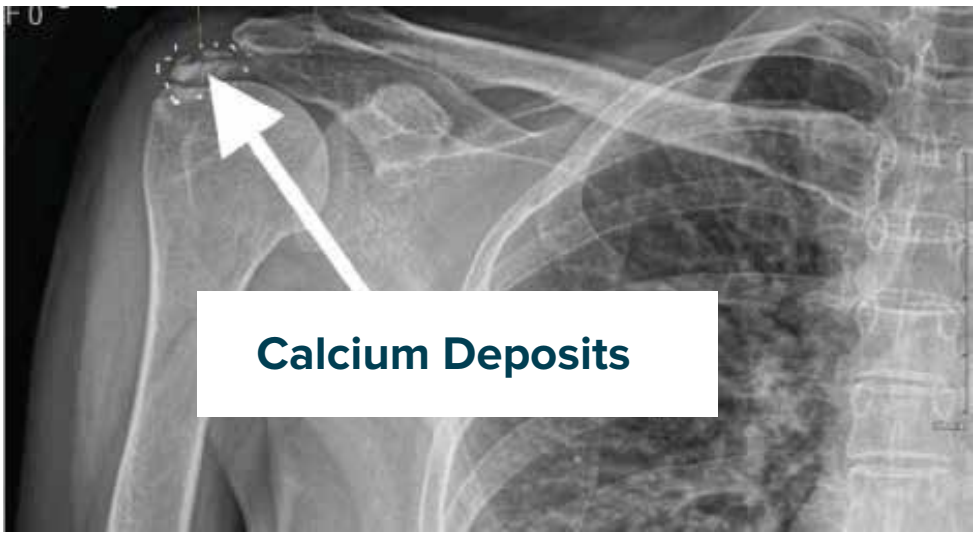
July 27, 2018

Dec 31, 2018

Dosage: Marah- Cel 2x /day for first 2 months and then only 1x. Able to walk normally again.

Decalcification Effects of SAC

Removing Calcification from Cellular to Systemic Level is a Key to Recovery



Conditions Commonly Treated with SAC

Cellular Recovery Helps to Restore Mitochondrial Function & Reduce Oxidative Stress

- Autoimmune disease (Lupus, Vitiligo, Hashimoto's, Crohn's, Celiac disease, eczema, MS, rheumatoid, etc.)
- Lyme disease, HIV, Shingles and other viral infections
- Parkinson's, ALS, Alzheimer's and other neurodegenerative diseases
- Arthritis, Gout, CPPD, Inflammations
- Mitochondrial Disease
- Cancer (carcinoma, sarcoma, lymphoma, leukemia, multiple myeloma)
- Arrhythmia, Heart palpitation, Mitral Valve Prolapse,
- Diabetes, Metabolic Syndrome
- Thrombosis, Hemolytic Anemia
- Autism Spectrum Disorder
- ADHD, Epilepsy
- Asthma, COPD
- Glaucoma, Cataract, Intermittent Exotropia, Retinal Vein Occlusion
- Menier's Disease, Aurora Migraine
- Disease, Tinnitus, Vertigo
- Osteoporosis, Bone Necrosis
- Chromosome 8 syndrome
- Chronic Kidney Disease
- Gum disease, Loose teeth
- Calcification (joints and tissues)
- Calcific tendonitis, Fibrosis, Kidney and Gall Bladder Stones
- Dysmenorrhea, infertility

SATISFACTION SAC FORMULATION TECHNOLOGY GUARANTEED

MADE IN CANADA MADE IN CANADA

REGISTERED WITH Health Canada HEALTH CANADA

RECYCLABLE CONTAINER BOUTEILLE RECYCLABLE

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16 Fawcett Rd. COQ. BC. V3K6X9
www.marahnatural.com