R3 STEM CELL™

• REPAIR
• REGENERATE
• RESTORE

DIETARY GUIDELINES FOR STEM CELL THERAPY

BY DR. TAIYBA SULTANA

R3 CONSULTANT NUTRITIONIST/
DIETITIAN

FORWARD

First of all, thank you for delving into R3 Stem Cell's Dietary Guidelines Ebook. The first guideline is to definitely consume ALL that this guide has to offer!

As relatively new technology, stem cell and exosome therapies are showing amazing results for many chronic medical conditions. For those who undergo regenerative treatments, it is important to understand that stem cells are amazing at improving quality of life in patients who often have failed many traditional options.

But it is also vital to understand that one's diet can play a critical role in how effective a stem cell treatment is, and how long the results will last. Not only does this guidebook discuss foods that are recommended before and after treatment, but also recommended supplements to facilitate the stem cell function for tissue regeneration and repair.

Anyone who invests in a stem cell procedure does so with a desire to improve health, which is the true "wealth" in our society. Why not optimize the outcome by incorporating these guidelines. Your body will definitely thank you, and so will the stem cells as they go to work with the proper environment and tools necessary for tissue construction!

R3 Stem Cell has been a global leader in providing first rate regenerative therapies that are safe, cost effective and achieves tremendous outcomes for patients. Not only does R3 excel in the stem cell biologics being administered, but also in patient education, research and a true desire to see individuals get the best results possible without "breaking the bank".

With our mission first and foremost focused on first rate patient outcomes, our staff consistently scours global regenerative research to incorporate best practice protocols. That includes the dietary guideline information presented here!

When you have treatment at an R3 Stem Cell Center of Excellence, we treat you just as we would our own family. Should you or a loved one desire a consultation to see if you are a candidate for treatment, or have any post-procedure questions, call us at +1 (844) GET-STEM today!

DIETARY GUIDELINES FOR STEM CELL THERAPY PATIENTS

BY DR.TAIYBA SULTANA

R3 CONSULTANT NUTRITIONIST/DIETITIAN

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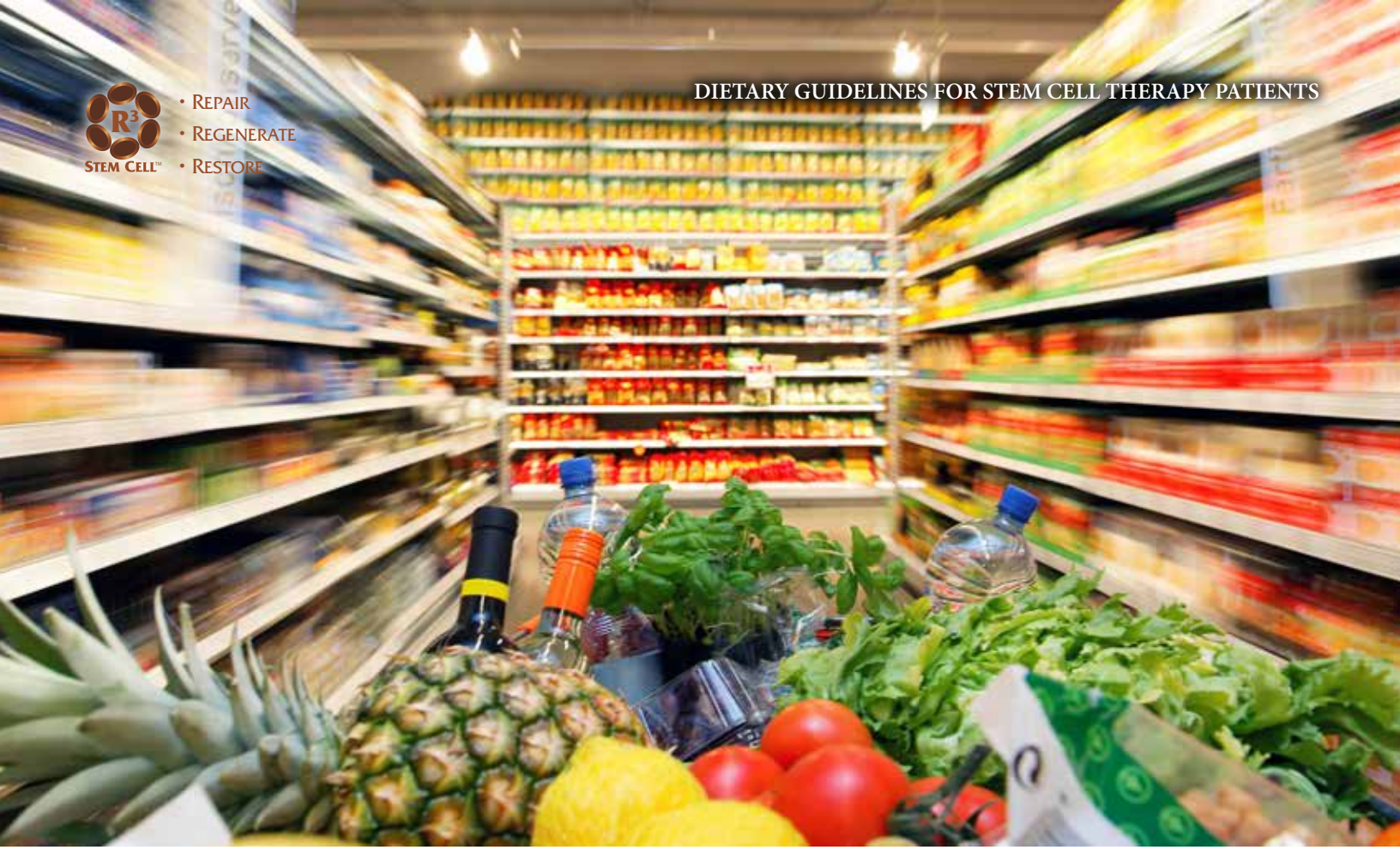


INTRODUCTION

What is stem cell therapy?

Stem cell therapy is a form of regenerative medicine designed to repair damaged cells within the body by reducing inflammation and modulating the immune system. This phenomenon makes stem cell therapy a viable treatment option for a variety of medical conditions. Stem cell therapies have been used to treat autoimmune, inflammatory, neurological, orthopedic conditions and traumatic injuries with studies also conducted on use for Crohn's disease, Multiple Sclerosis, Lupus, COPD, Parkinson's, ALS, Stroke recovery and more.

While stem cell therapy does not necessarily provide a cure for these conditions, the premise is to allow the body to heal itself well enough to mitigate the symptoms of the conditions for long periods. In many cases, this effect can substantially increase the quality of life for patients as well as delay disease progression.

Where do stem cells come from?

Stem cells can be obtained from many different sources. These include adipose (fat tissue), umbilical cord tissue, placental tissue, umbilical cord blood, or bone marrow.

How are stem cells administered?

Stem cells can be administered by a variety of methods; IV Stem Cell Therapy (Intravenous administration), Intrathecal (directly into the spinal canal), Site injections directly into problem areas (Knee, hips, hands, etc.), nebulizer for the lungs, or intranasal.

How does stem cell therapy work?

When stem cells are administered into the body and arrive into the injured part, they act through paracrine signaling & other mechanisms. There are several methods we know of how stem cells work in one's body:

1. Paracrine signaling – cell to cell communication.
2. New blood flow = angiogenesis
3. Anti-apoptosis = prevent cell death
4. Cell proliferation = enhance specialty cell proliferation
5. Immune system modulation
6. Inflammation reduction

Stem cells are used in the treatment of a wide range of diseases including cancer, baldness, auto-immune diseases, cardiovascular and ocular to name just a few.

Stem cells age as we do:

Stem cell numbers and effectiveness begin to decrease exponentially as we age. For example, bone marrow stem cells from a person in his/her fifties are not nearly as high in quantity or quality as the brand new cells sourced from umbilical cord tissue.

How is stem cell therapy utilized?

Stem cell therapy may be able to treat orthopedic, inflammatory, autoimmune and neurological conditions, with studies conducted on use for Crohn's Disease, Multiple Sclerosis, Lupus, COPD, Parkinson's, ALS, Stroke recovery and more. Stem cells do not necessarily provide a cure for these conditions. The premise is allowing the body to heal itself well enough to mitigate the symptoms

of the conditions for long periods. In many cases, this alone allows for a substantial increase in quality of life for patients. Previously untreatable neurodegenerative diseases may now possibly become treatable with advanced stem cell therapies.

Stem cells derived from the umbilical cord are potent, safe, and highly effective in the treatment of many different diseases. Their activity in one's body is significantly higher than that achieved with one's own bone marrow or adipose tissue. Regenerative medicine and its benefits with umbilical cord stem cells may be the key to prolonging human life while increasing quality of life in patients who have failed conventional treatments.

R3 Stem Cell Centers offers regenerative procedures including:

- Stem cell injections derived from a patient's own Bone Marrow or Adipose
- Umbilical Cord Blood Stem Cell procedures
- Umbilical Cord Tissue Stem Cell Procedures
- Stem Cell Derived Exosome Procedures
- Platelet Rich Plasma Therapy

Nutritional counseling of stem cell patients:

Nutritional counseling is designed to assist regenerative clients in learning one of the most noteworthy requirements for good health (i.e. a healthy diet). This is always tailor-made for each prerequisite and based on laboratory standards. Irrespective of your goals, whether it is to slim down, race in a triathlon, or manage a chronic disease; the eating habits you adopt may make all the difference between failure and success.

What conditions can benefit from clinical nutrition?

At R3 Stem Cell, we believe that a right diet can benefit every aspect of your health. Here is a partial list of conditions that can take advantage of clinical nutrition.

- Allergies
- Arthritis
- Asthma
- Autoimmune disorders
- Obesity
- Cardiovascular disease
- Chronic fatigue
- Chronic gastrointestinal (GI) problems
- Diabetes
- Constipation
- Fibromyalgia
- Gastroesophageal reflux disease
- Hypertension
- Irritable bowel syndrome
- Pregnancy
- Painful Joints and Soft Tissues

Nutrition counseling may be a good choice if:

- You prefer a more tailor-made plan and want to be working with a nutritionist personally
- You suffer with an autoimmune disorder that is provoked by diet and food triggers
- You have a health ailment that is chronic and you need help managing symptoms
- You have tried other diet and lifestyle tactics and are not getting the outcomes you desire
- You wrestle with bad spells of depression and/or nervousness on a regular basis
- You have joint and muscle pain or struggle with bone pain and other skeletal problems
- You find that you are often feeling worn-out or unenthusiastic throughout the day
- You want to drop kilos, burn fat, improve energy levels and improve mental acuity
- You want to sleep better at night and have an enhanced outlook throughout the day
- You deal with digestive problems and stomach complications
- You want to help other family members also live a healthier standard of living.

R3 Stem Cell is playing an essential role in maintaining a healthy life of a patient which is very important for our patients who are suffering from prolonged disease. With the proper combination of diet and treatment, patients get more significant improvements. For a better quality of life, individuals should incorporate a healthy diet, regular exercise, stress reduction, obtain adequate sleep, and maintain positive thinking.

PRE-STEM CELL THERAPY DIETARY GUIDELINES

GUIDELINES TO ENHANCE YOUR STEM CELLS BEFORE TREATMENT

To improve quality, quantity & functioning of stem cells follow these guidelines:

1. Nutrition

Reduce Your Sugar Intake

It is wise to be on a diet that excludes all or nearly all sugar prior to your stem cell procedure. It is also worth having your doctor check your blood for hemoglobin A1C (HBA1C) which reflects the average blood glucose for the prior 3 months. The HBA1C you're aiming for is close to 5.0 or lower, however, up to 7 is tolerable depending on your regular baseline. A high HBA1C often indicates a diagnosis of either Pre-Diabetes or Diabetes.

Go Organic

Pesticide residues are commonly found on and in the foods we eat. For example, the USDA found that an apple can commonly have 47 different pesticide residues (after washing!) of which, many are known as probable carcinogens, hormone disruptors, neurotoxins, developmental or reproductive toxins. Pesticides can induce premature aging of adult stem cells and shift their path toward making more fat cells instead of tendon or cartilage cells.

Reduce Your Calories

It has been proven that even short-term calorie restriction can improve stem cell function. A review published in The Malaysian Journal of Medical Sciences has outlined what effects caloric restriction (CR) has on the development and differentiation of stem cells.

We recommend reducing your calorie intake by approximately 20% during the two weeks before you have your stem cell procedure. One strategy that can be helpful is called intermittent fasting.

Reduce Your Triglycerides

Patients who have high triglycerides or obesity issues also have stem cells that grow poorly and are less active. Our recommendation for those looking to lower their TRGs is to get them measured, reduce your sugar, carbohydrates, and calorie intake to get your body down to normal TRG levels before having your stem cell treatment.

2. Stay Active, Exercise, and Lift Weights

People who are more active have better quality stem cells that are more active. This research also shows that stem cells in muscles are increased by exercise and lifting heavy weights. In general, target 150 minutes per week of aerobic activity (2.5 hours).

Perhaps a more time efficient approach to aerobic fitness is high-intensity interval training, though you should talk to a skilled professional before implementing. If you have injuries or health issues that limit your workout capabilities, simply focus on what you can do. Try light activities in the pool or take daily walks. The goal is simply to increase your activity level so that the stem cells get the highest quality environment from the start.

3. Try Taking Healthy Supplements

Common nutritional supplements may be beneficial to both stem cell and cartilage. These include vitamin D3 and C, Curcumin, Glucosamine, Chondroitin, Resveratrol, and Fish Oil.

Vitamins C and D

Vitamin C helps out stem cells by promoting their proliferation (increase in numbers). Vitamin D3 can reduce the aging of our stem cells, make them healthier, and help them differentiate, or turn into other types of cells. Recommended dose for vitamin C is 250-500mg twice daily, with slight variations for the age of the patient, and for vitamin D it is 5000IU per day.

Curcumin

Curcumin may sound familiar as it is the active ingredient in the spice, turmeric. Curcumin has strong anti-inflammatory properties and performs well in helping mesenchymal stem cells function better. Recommended dose of Curcumin for stem cell patients is 1000mg per day.

Glucosamine and Chondroitin

Glucosamine and Chondroitin protect cartilage and reduce cartilage loss, helping stem cells function better. The recommended dose is 1500mg/day.

Resveratrol

Studies have shown that Resveratrol also protects cartilage and helps stem cells differentiate and multiply. Resveratrol also helps to control blood sugar. The recommended dose for stem cell is 500mg/day.

Powder with Organic Green Superfood

Greens powder is a dietary supplement that has become a popular way to help people reach their daily recommended intake of vitamins and minerals. The nutrient combination in greens powder is formulated to support your body's immune system and energy levels while meeting the nutrition requirements. Ingredients in greens powders vary by brand, but commonly include nutrition from: Leafy greens and seaweed, grasses and other vegetables, antioxidant-rich fruits, probiotics, nutritional extracts and herbs. Greens powders often include high levels of vitamin C, which has been linked to improve cellular health of stem cells & healthy immune system function, protection against heart disease, and good skin health. Added or mixed with different foods in diet as 1tbsp/day.

Boswellia Serrata

Boswellia is an effective anti-inflammatory herb; it can be an effective painkiller and may prevent the loss of cartilage. Some studies have found that it may even be useful in treating certain cancers, such as leukemia and breast cancer. Boswellia may interact with and decrease the effects of anti-inflammatory medications.

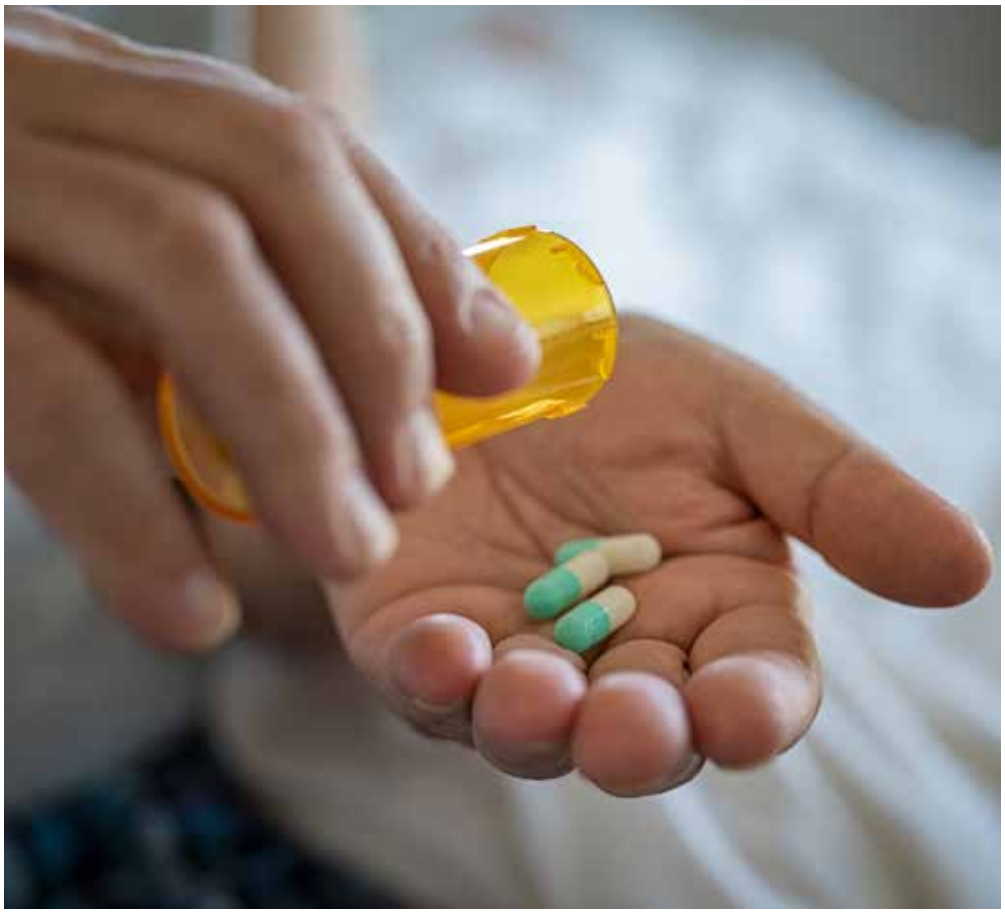
General dosing guidelines suggest taking 300–500 milligrams (mg) by mouth two to three times a day. The dosage may need to be higher for IBD. The Arthritis Foundation suggests 300–400 mg three times per day of a product that contains 60 percent boswellic acids. Recommended dosage for stem cell patients is 500-1000mg twice a day.

Omega3 Fatty Acids

Omega-3 fatty acids are incredibly important. They have many powerful health benefits for your body and brain. Omega-3 supplements may help prevent and treat depression and anxiety. EPA seems to be the most effective at fighting depression. An omega-3 fatty acid called DHA is a major structural component of eyes' retinas. It may help prevent macular degeneration, which can cause vision impairment and blindness.

Getting enough omega-3s during pregnancy and early life is crucial for child's development. Supplementing is linked to higher intelligence and a lower risk of several diseases.

Omega-3s improve numerous heart disease risk factors. Omega-3 supplements can reduce the symptoms of ADHD in children. They improve attention and reduce hyperactivity, impulsiveness and aggression. Omega-3s can reduce chronic inflammation, which can contribute to heart disease, cancer and various other diseases. Omega-3 fats may help prevent age-related mental decline and Alzheimer's disease. Recommended dosage for stem cell patients is 1 to 1.5g per day.



Ginkgo Biloba

The therapeutic properties of the ginkgo plant are said to include treatment for blood disorders and memory problems, enhancement of cardiovascular function and to improve eye health. Gingko contains high levels of flavonoids and terpenoids, antioxidants that provide protection against oxidative cell damage from harmful free radicals. In this way, antioxidants are believed to help reduce cancer risk. It may help with cognitive function. Traditional uses include soothing a bladder infection and increasing sexual energy. Other benefits may include: Improved thinking and memory, better social behavior, better ability to perform everyday tasks.

One study found that an extract of ginkgo biloba, known as EGb 761, was clinically effective in treating Alzheimer's dementia. People who should not take gingko biloba include:

- Children
- Pregnant or breastfeeding women
- Those with epilepsy
- People taking blood thinners

For stem cells patients recommended dosage is 240mg/day.

4. Review Your Prescription and Over-The-Counter Medications

Seven days before your injection, do not take any anti-inflammatory medicine. Do not take medicines like Aspirin (except baby dose), Motrin, Advil, Aleve or Naprosyn. Also cease taking statin medications, H2 Blockers (PPIs like Zantac, Pepcid).

Tell your doctor if you are on any blood thinning medications prior to procedure.1-2 days before the procedure, drink 64 ounces of water per day. The day of your injection, drink as much water as you can - preferably, 64 ounces of water.

Medication to discontinue before stem cell therapy:

Discuss with your primary care doctor before stopping any medications

Anti-inflammatory:

These medications should be discontinued a week prior to your procedure.

- NSAIDs (including: Advil, Motrin, Aleve, Voltaren, Mobic, Celebrex)
- Aspirin
- Blood thinners
- Coumadin, Plavix, Xarelto, Pradaxa, Eliquis, Aggrenox
- Osteoporosis Medications - Bisphosphonates
- Reflux (GERD) Medications- Proton Pump Inhibitors such as Prilosec, Prevacid, Zegerid, Protonix, Nexium, and AcipHex
- Statin Medications – such as Lipitor

In the presence of these medications, stem cells do not flourish, which is why we recommend discontinuing the use of these medications 7 days before your procedure and continuing to stay off these medications 4 weeks after your procedure. Do not discontinue use of these medications unless your primary care doctor approves.

These are various prescription drugs like Advil, Motrin, Aleve, Voltaren, Mobic, Celebrex, Coumadin, Plavix, Xarelto, Pradaxa, Eliquis, Aggrenox , Prilosec, Prevacid, & Zegerid that actually hurt the ability of stem cells to multiply and grow. We have seen many patients that were on a certain medication and had difficulty growing their stem cells. Taking the patients off these medications reversed the problem. Never stop a prescription medication without first consulting with your Physician.

5. Avoid Taking Steroids When Possible

From asthma to knee pain to herniated discs, high-dose steroids (sometimes referred to as cortisone) are used for many reasons. While they may be powerful anti-inflammatories, the issue is that steroids wreak havoc on stem cells. Steroids make it hard for stem cell to reach inflammation site & hinder its anti-inflammatory activity. Steroids have the potential for serious adverse effects. If you are scheduled for a stem cell treatment and are taking steroids, your physician can help recommend safer alternatives or acceptable substitutes to protect your stem cells. (Note: do not make any steroid dose changes without consulting your physician first).

6. Reduce Your Alcohol Intake

Alcohol can have profound negative impacts on stem cell function, so this should generally be avoided (or highly reduced) before and after the procedure.

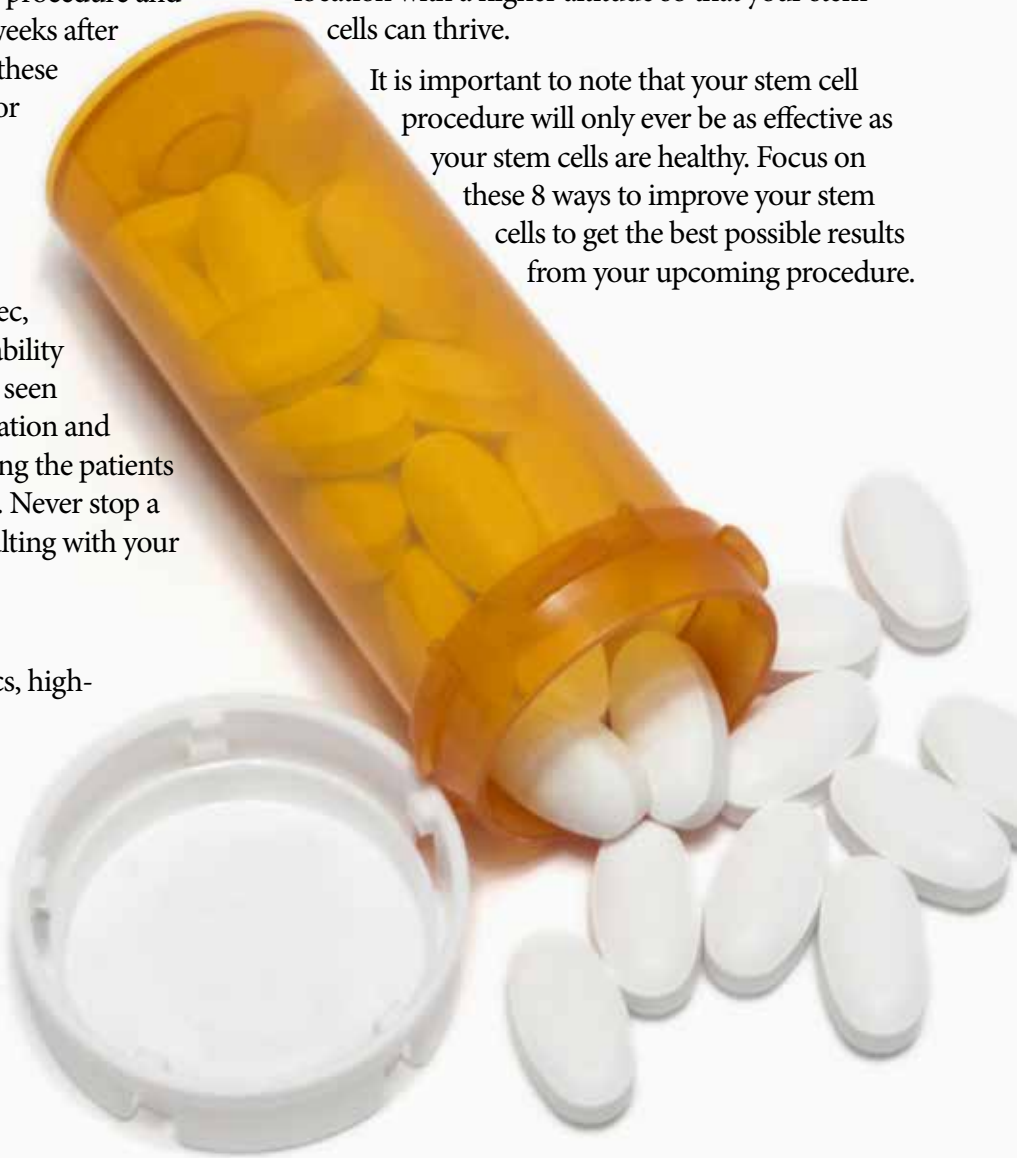
7. Stop Smoking or Using Tobacco

Smokers do not heal as well as non-smokers. If you are seeking to maximize your outcomes, please stop smoking!

8. Consider a Trip to a Higher Altitude

Many elite athletes sleep in lower oxygen environments to reap the benefits of low oxygen. Stem cells grow and stay more viable at low oxygen levels. Before your stem cell procedure, consider taking a little vacation to a location with a higher altitude so that your stem cells can thrive.

It is important to note that your stem cell procedure will only ever be as effective as your stem cells are healthy. Focus on these 8 ways to improve your stem cells to get the best possible results from your upcoming procedure.



Dietary Protocol Prior to Stem Cell Therapy:

- Therapeutic Ketogenic Diet/Low Carb Diet
- Anti-inflammatory Diet
- Casein Free Gluten Free Diet

Therapeutic Ketogenic Diet:

The therapeutic ketogenic diet is similar to the LCHF approach but takes it one step further, with net carbs typically restricted to 25g per day (or sometimes less) and protein restricted to the minimum necessary for muscle repair. It is actually intentional restriction of dietary carbohydrate intake to accelerate the production of ketones and induce a metabolic effect that stabilizes blood sugar, minimizes insulin release, and thereby mitigates the downstream anabolic and tumorigenic effects of longstanding insulin resistance.

A "well-formulated" ketogenic diet is composed of 5–10% carbohydrates (<20–50g/day), adequate protein (1–1.5g/kg/day), and fat until satiated. The hallmark of nutritional ketosis is blood ketone levels of 0.5 to 3 mg/dL

There are several versions of the ketogenic diet, including:

Standard ketogenic diet (SKD): This is a very low carb, moderate protein and high fat diet. It typically contains 70% fat, 20% protein, and only 10% carbs.

Cyclical ketogenic diet (CKD): This diet involves periods of higher carb refeeds, such as 5 ketogenic days followed by 2 high carb days.

Targeted ketogenic diet (TKD): This diet allows you to add carbs around workouts.

High protein ketogenic diet: This is similar to a standard ketogenic diet, but includes more protein. The ratio is often 60% fat, 35% protein, and 5% carbs.

Gluten-free, casein-free diet

Often called a GF/CF diet, this eating plan avoids foods that contain gluten (found in many breads and cereals) and casein (found in milk products). Eliminating gluten and casein may help to change symptoms and behaviors of autism.

While following this diet we advise patient to start the diet slowly. Don't try to take out all gluten- and casein-containing foods at once. Add new gluten-free and casein-free foods gradually, about one food every 3 to 7 days. If a new food causes a problem, you will know which one it was. It may take 3 months to become fully gluten- and casein-free. Read all food labels. Gluten and casein are found in many forms and go by many different names. Stickers, stamps, and envelopes have gluten in the glue.

Some medicines and antibiotics contain gluten, so check

with your doctor or pharmacist before giving them. Be careful not to mix GF/CF foods with other foods when using household appliances such as toasters, ovens, microwaves, and waffle irons. Use a separate toaster. When using ovens or microwaves, keep GF/CF foods in separate containers from other foods.

Anti-inflammatory Diet

An anti-inflammatory diet focuses on fresh fruits and vegetables. Many plant-based foods are good sources of antioxidants. Some foods, however, can trigger the formation of free radicals. Examples include foods that people fry in repeatedly heated cooking oil. An anti-inflammatory diet favors foods that are rich in antioxidants over those that increase the production of free radicals.

Dietary antioxidants are molecules in food that help remove free radicals from the body. Free radicals are the natural byproducts of some bodily processes, including metabolism. However, external factors, such as stress and smoking, can increase the number of free radicals in the body.

Free radicals can lead to cell damage. This damage increases the risk of inflammation and can contribute to a range of diseases. The body creates some antioxidants that help it remove these toxic substances, but dietary antioxidants also help. It serves as a complementary therapy for many conditions that become worse with chronic inflammation.

An anti-inflammatory diet should combine a variety of foods that:

- Are rich in nutrients
- Provide a range of antioxidants
- Contain healthful fats

POST STEM CELL THERAPY DIETARY GUIDELINES

Recovering procedure patients need 50 to 60 percent more calories and twice as much protein in their diets than healthy individuals of similar age and gender. This increase in caloric and protein intake will help you fight infection and repair any tissue damage. You may need to stick to this diet for several months. Getting enough calories, protein and fluids into your body can be difficult, particularly during the first few weeks after procedure.

Problems such as:

- Nausea and vomiting
- Dry mouth
- Diarrhea
- Changes in taste
- Constipation
- Depression
- Fatigue

Below are suggestions for managing some common problems after procedure that may make it difficult for you to eat.

Dry Mouth

Dry mouth is a common side effect of total body irradiation, nausea medications, and antihistamines. If a dry mouth is making eating difficult, try the following:

- Add sauces, gravies, broth and dressings to food.
- Suck on ice chips, popsicles, sugarless gum or hard candies to keep your mouth moist.
- Add citric acid to your diet to stimulate saliva, unless you also have mouth sores. Citric acid is in oranges, lemons, and sugarless lemon drops.
- Drink clear liquids with and between meals.
- Practice good mouth and dental care to decrease the risk of infection.

Avoid eating:

- Meats without sauces
- Bread products, crackers and dry cakes
- Very hot foods and beverages
- Alcoholic beverages and mouthwashes that contain alcohol

Changes in How Food Tastes

To overcome this problem, try:

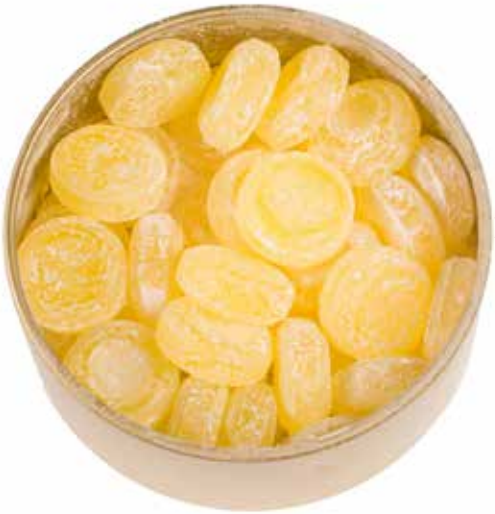
- Cold foods and beverages
- Strongly flavored foods such as chocolate, lasagna, spaghetti or barbecued foods, unless you also have mouth sores
- Tart or spicy foods, unless you also have mouth sores
- Fluids with your meal to rinse away any bad taste

- Protein foods without strong odors such as poultry and dairy products, rather than those with strong odors such as beef and fish
- Sauces with foods
- Meats with something sweet, such as cranberry sauce, jelly or applesauce
- New combinations of seasonings or adding sugar or salt to enhance the flavor
- If food has a metallic taste, try using plastic eating utensils.

Thick Saliva

Dehydration can cause thick saliva. If thick saliva is interfering with your eating, try the following:

- Drink club soda or hot tea with lemon.
- Suck on sugarless sour lemon drops.
- Eat a lighter breakfast if mucous builds up in the morning, and bigger meals in the afternoon and evening.
- Rinse frequently with a saline solution of one quart water, 1/2 teaspoon of salt and one to two teaspoons of baking soda.
- Drink lots of fluids.
- Eat soft, tender foods such as cooked fish and chicken, eggs, noodles, thinned cereals, and blenderized fruits and vegetables diluted to a thin consistency.
- Eat small, frequent meals
- Drink diluted juices, broth-based soups and fruit flavored beverages
- Eat moist fruits like melons
- Try a liquid diet if the problem is severe.



Avoid eating:

- Meats that require chewing
- Bread products
- Oily foods
- Thick cream soups
- Thick hot cereals
- Nectars

Nausea and Vomiting

If nausea is interfering with your ability to eat, try eating:

- Small frequent meals
- Dry crackers or toast, especially before movements like getting out of bed, unless you also have mouth sores
- Pretzels, vanilla wafers and angel food cake
- Cold foods, rather than warm foods, because they tend to have less odor
- Low-fat foods like cooked vegetables, canned fruit, baked skinless chicken, sherbet, fruit ice, popsicles, gelatin, pretzels, vanilla wafers and angel food cake
- Clear, cool beverages, sipped slowly through a straw frequently throughout the day
- Gelatin, popsicles and ice cubes made of a favorite liquid

If you are hospitalized you can:

- Request anti-nausea medication 30 minutes before your meal
- Ask that food trays be brought to you without covers on the plates to avoid being overwhelmed by the smell when the cover is removed

Avoid eating:

- Spicy foods
- Foods that are overly sweet
- Strong smelling foods
- Foods that are high in fat
- Hot liquids with meals
- Drinking liquids on an empty stomach
- Perfumes and other strong scents
- Keep food in kitchen areas and leave the kitchen if you feel queasy. Avoid lying flat on your back after eating as this can make nausea worse.
- If you are nauseated, don't lie flat on your back after eating. This can make the problem worse. If you need rest, sit or recline with your head elevated.

- Your doctor can also prescribe a medication to help control your nausea.

Lack of Appetite/Weight Loss

Many people experience lack of appetite and weight loss after a stem cell procedure. If you have a poor appetite try eating:

- Small, frequent high-calorie meals
- High-nutrient liquids like juice or milk, instead of low-calorie drinks like coffee, tea and diet soda
- Nutrient-dense, high-calorie foods like:
- Pasteurized cheese, whole milk, and ice cream
- Eggs
- Avocados
- olives
- Greek yogurt
- hummus
- trail mix
- fruit smoothies
- protein powder
- dried fruit
- peanut butter
- Wheat germ
- Nuts
- Fruits
- Protein supplements such as Promod® or Unjury®
- Complete nutrition supplements such as Ensure®, Boost®, Carnation Instant Breakfast® or Enu®, provided they have been approved by your dietitian
- Adding dry milk powder to casseroles and cooked cereals

You can also try:

- Light exercise before meals to increase your appetite
- Creating a pleasant meal time atmosphere e.g. colorful place settings, varied food colors and textures, soft music, etc.
- Working with a healthcare professional to address any sadness you are feeling that might be affecting your appetite
- Asking your doctor about oral medications that may improve your appetite

Diarrhea

If you experience diarrhea, try eating:

- Smaller amounts of food at each meal
- Extra fluids to prevent dehydration
- Drinking fluids between meals, rather than with meals
- Foods and beverages that are high in potassium such as:
- Ripe bananas
- Potatoes without the skin
- Tomato juice, Gatorade®, Pedialyte®, Powerade®, orange juice, and pasteurized peach and pear nectar
- Baked fish, chicken and ground beef
- Well cooked eggs
- Well-cooked vegetables (but not beans, broccoli, cauliflower or cabbage)
- Canned fruit
- white rice
- white bread

Avoid eating:

- Bran or whole grain cereals and breads
- Raw vegetables
- Fruits with skin and seeds
- Popcorn. seeds and nuts
- Carbonated beverages
- Beans, broccoli, cauliflower and cabbage
- Chewing gum
- Spicy foods
- Foods with rich gravies or sauces
- Foods and drinks with caffeine such as coffee, tea, chocolate, colas and other caffeinated soft drinks
- Dairy products unless they are treated with Lactaid®
- Do not take over-the-counter medications like Imodium® without first consulting your doctor. If you have a colon infection, these drugs can sometimes make the infection worse.

Milk products & freshly squeezed juices are restricted if

diarrhea/vomiting occur. Avoid restaurant or fast food

Constipation

If you experience constipation, try:

- Drinking warm beverages
- Eating high-fiber foods such as
- Well washed raw fruits and vegetables
- Whole wheat breads and cereals
- Dried fruit
- Light exercise
- Drinking warm prune juice or eating stewed prunes

Your doctor may be able to prescribe medication if the constipation persists for more than a day or two.

Dietary Protocol:

Food Safety:

After stem cell procedure to avoid possible food borne illness & to reduce intrinsic & extrinsic factors that damage stem cells the following is recommended.

Food items you may be told to avoid may include:

- Raw or undercooked meat
- Dishes that may contain undercooked meat such as sausages or casseroles
- Raw or undercooked eggs or foods that might contain them
- Raw or undercooked seafood such as sushi
- Raw nuts or unshelled nuts
- Miso and tempeh products
- Non-pasteurized milk products and juices, kombucha and other unpasteurized drinks
- Cheeses with mold
- Soft cheeses such as brie or feta
- Mexican style cheeses, such as queso fresco and queso blanco, which are often made with unpasteurized milk
- Meats and cheeses from a deli
- Smoked, uncooked refrigerated fish such as nova lox
- Pickled seafood
- Raw honey
- Salad bars and buffets

Herbs, Botanicals and Supplements

Until your immune system has fully recovered, you should avoid taking any herbal or botanical product without your doctor's approval.

Some of these products can:

- Reduce the effectiveness of other drugs you are taking
- Cause a serious infection due to inadequate purification of the product or extra ingredients it contains
- Damage your liver, kidneys or other organs
- Make gastrointestinal problems worse
- Interfere with blood clotting

Herbal and botanical products to avoid while your immune system is recovering include:

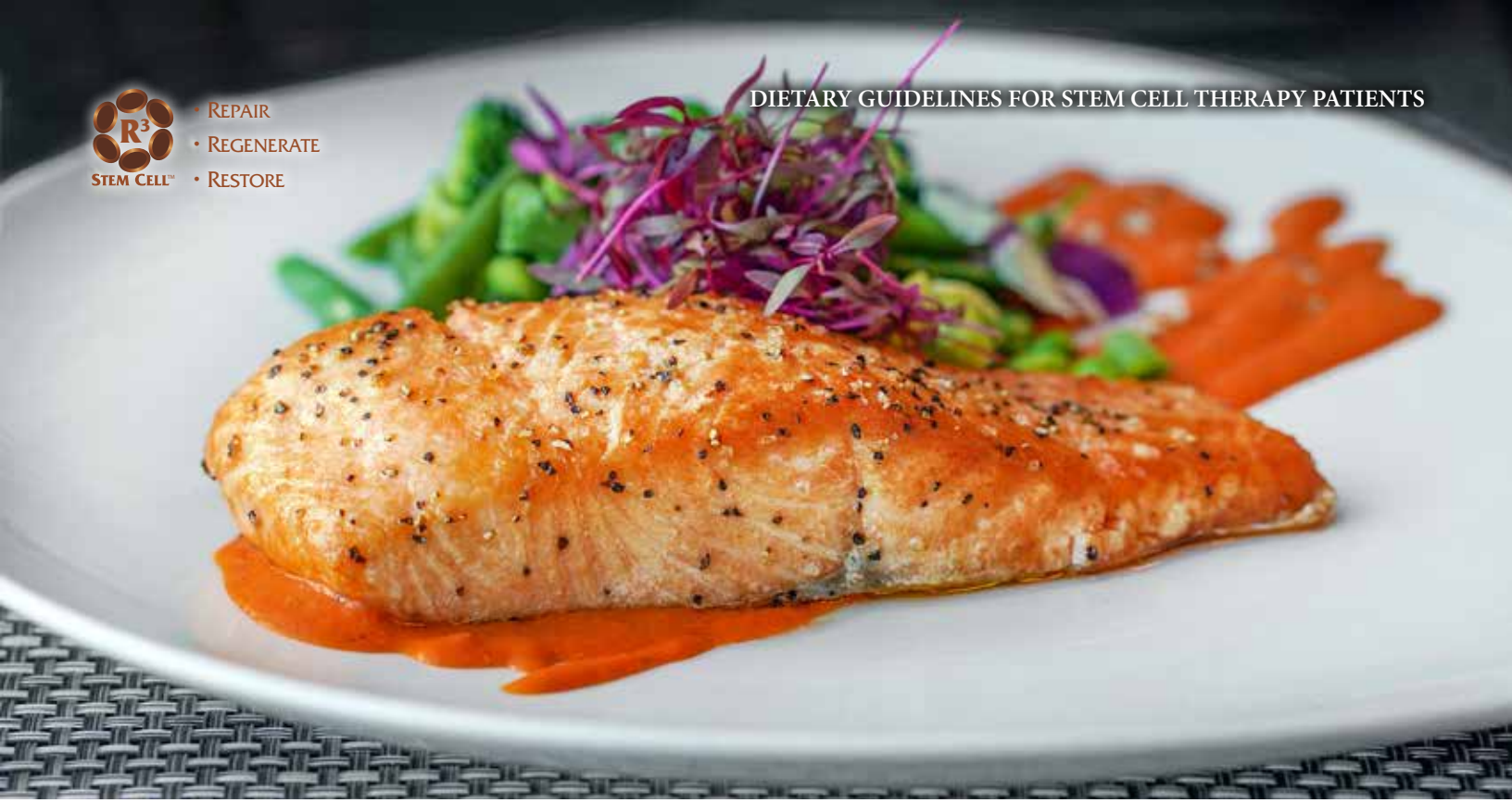
- Alfalfa
- Borage
- Chaparral
- Chinese herbs

- Coltsfoot
- Comfrey
- DHEA
- Dieter's Tea (including senna, aloe, rhubarb root, buckthorn, cascara, castor oil)
- Ephedra
- Groundsel or Life Root
- Heliotrope or Valerian
- Kava Kava
- Laetrile (Apricot Pits)
- Licorice Root
- Lobelia
- L-tryptophan
- Maté Tea
- Pau d'arco
- Pennyroyal
- Sassafras
- St. John's Wort
- Yohimbe and Yohimbine
- If your platelet count is low, you should avoid garlic pill supplements (cooking with regular garlic is fine) and gingko biloba, which can interfere with blood clotting.

Supplements Prescribed after stem cell therapy:

- Glutathione (500mg/day)
- Vitamin C (500-1000mg/day)
- Vitamin D(2000-10000IU/day)
- Zinc (12-50mg/day)
- Fish Oil (500-1000mg/day) & many others according to condition.

Dosage of supplements varies according to person age & weight. Dietary restriction continues until patient feels improvement in their condition. A Post therapy diet plans addressing possible after effects & disease specific dietary restrictions are implemented for 3 months until condition improved then longitivity diet is prescribe. These are actually guidelines provided to reduce possible damage & slow aging of stem cells after stem cell therapy.



THE LONGEVITY DIET

This is actually diet program to lose weight, fight disease, and live a longer, healthier life. Following these dietary guidelines one can boost functioning of stem cells and promote regeneration and rejuvenation in multiple organs to significantly reduce risk for diabetes, cancer, Alzheimer's, and heart disease. Daily eating plan and the periodic fasting-mimicking techniques can both yield impressive results. Low in proteins and sugars and rich in healthy fats and plant-based foods, The Longevity Diet is proven to help you:

- Lose weight and reduce abdominal fat
- Extend your healthy lifespan with simple everyday changes
- Prevent age-related muscle and bone loss, slow down aging of stem cells
- Build your resistance to diabetes, cardiovascular disease, Alzheimer's and cancer

1-Eat a mostly vegan diet with some fish: Strive for a 100 percent

Plant-and fish-based diet, but limit fish consumption to two or three meals a week and avoid fish with high mercury content. After age sixty-five to Seventy, if you start losing muscle mass, strength, and weight, add more fish And fruit and introduce animal-based foods like eggs, cheese, and yogurt Made from sheep's or goat's milk.

2-Consume low but sufficient proteins: Consume approximately 0.31 to 0.36 grams of protein per pound of body weight per day. If you weigh 100 Pounds, that is about 31 to 36 grams of protein per day, of which 30 grams should be consumed in a single meal to maximize muscle synthesis. If you Weigh 200 pounds and have 35 percent body fat, 60 grams of protein per day Are instead sufficient, considering that it is the lean body mass that utilizes Most of the proteins. Protein intake should be raised slightly after age sixty-five to seventy in individuals who are losing weight and muscle.

3-Minimize bad fats and sugars, and maximize good fats and Complex carbs: The diet should be rich in "good" fats, including those from salmon, almonds, and walnuts, but very poor in "bad" fats. Likewise, the diet should be rich in Complex carbohydrates, such as those provided by whole bread and Vegetables, but poor in sugars and limited in pasta, rice, white bread, fruit Juices, and fruits containing carbohydrates that are easily converted into Simple sugars. Finally, the diet should be low in animal proteins but Relatively high in vegetable proteins, in order to minimize the former's Negative effects on diseases and maximize the latter's nourishing effects.

4-Be nourished: The body needs protein, essential fatty acids (omega-3 and Omega-6), minerals, vitamins, and sufficient sugar to fight the many wars Going on inside and outside cells. To be sure you get enough nutrients, every Three days take a multivitamin and a mineral pill, plus an omega-3 fish oil Soft gel purchased from a reputable manufacturer.

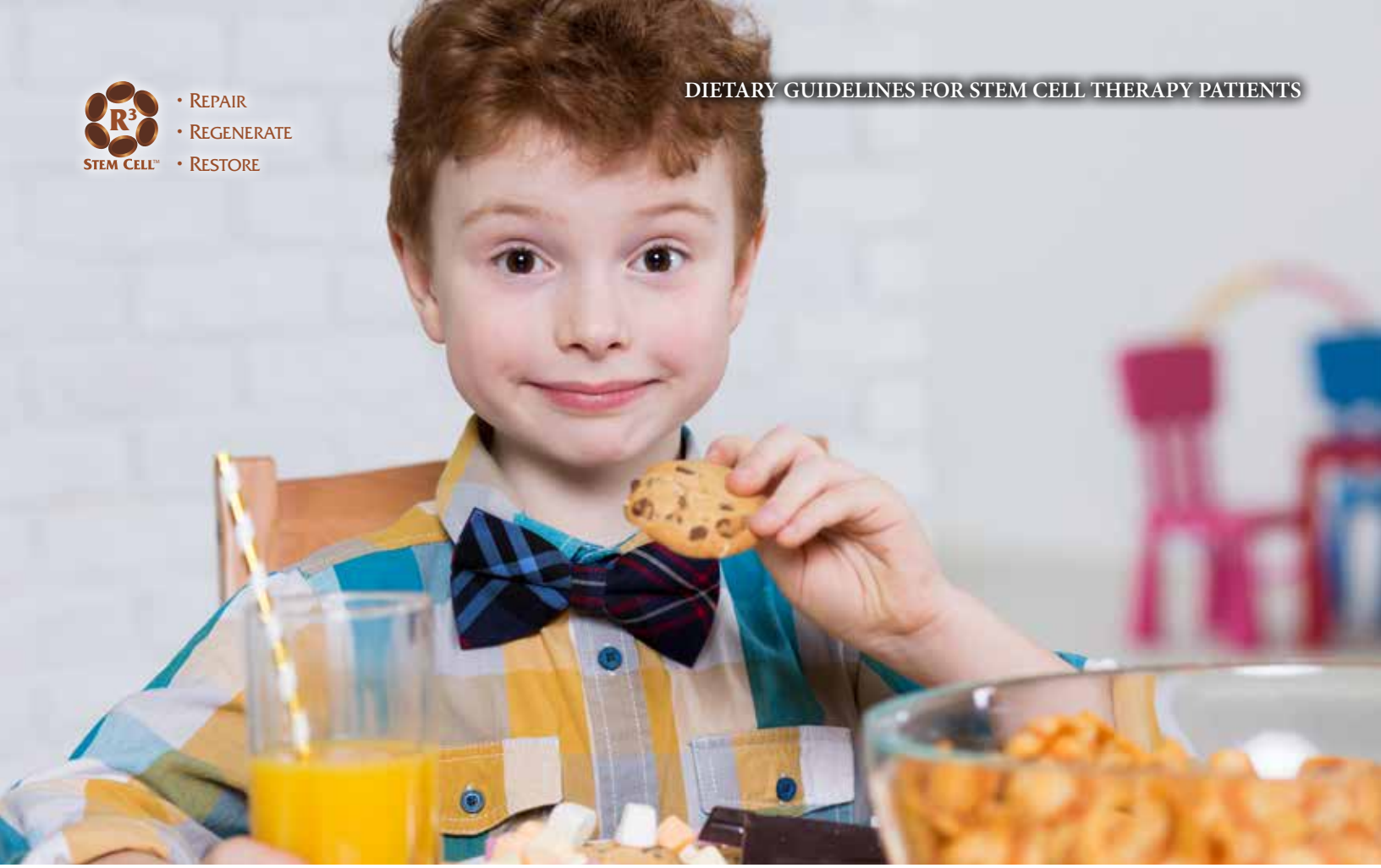
5-Eat twice a day plus a snack: Unless your waist circumference and Body weight are in the normal or low range, it is best to eat breakfast plus one other meal a day and one low-calorie, low-sugar, nourishing snack. If your weight or muscle mass is too low, then eat three meals a day plus a Snack.

6-Time-restricted eating: Restrict eating to eleven to twelve hours or Less per day. For example, if you eat breakfast after 8 a.m., finish dinner before 8 p.m. Shorter periods of feeding (ten hours or less) have been shown To be even more effective in promoting health, but they are much more Difficult to comply with and may increase the risk of side effects, such as the Formation of gallstones.

7-Periodic prolonged fasting-mimicking diets: People who are under Seventy years of age, not frail or malnourished, and free of certain diseases. Should undergo five-day periods during which they consume a relatively .High-calorie fasting-mimicking diet.

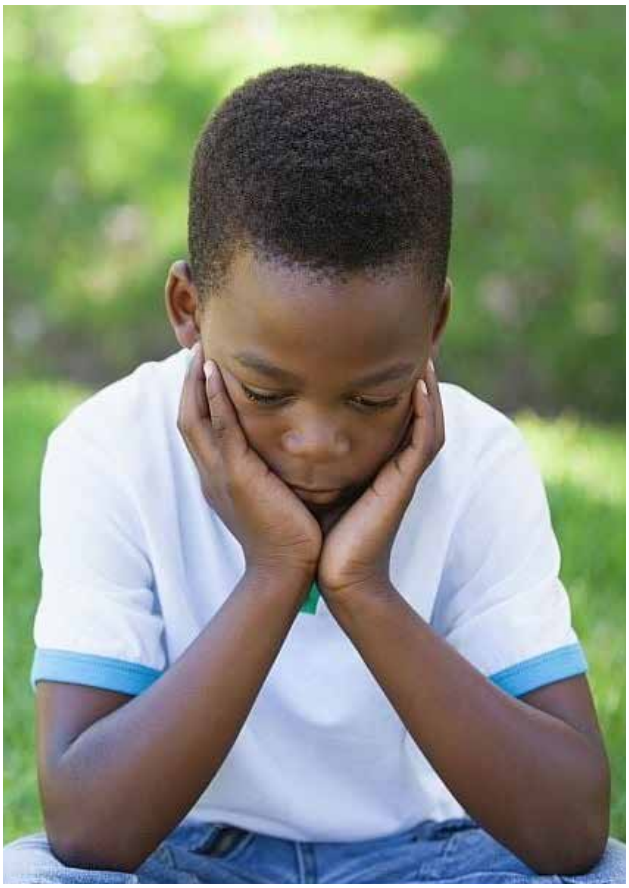
Follow steps 1 through 7 in such a way that you reach and maintain a waist Circumference of less than 35.5 inches for men and less than 29.5 inches for Women. This is higher than the ideal 33 inches and 27 inches cited earlier, But it is more realistic and should still be very effective in reducing disease .Risk while avoiding malnourishment.

Exercise for Longevity: Walk fast one hour per day. Take the stairs instead of escalators and elevators, Even if you have to go up many flights. On the weekend, try to walk, even to Faraway places, but avoid polluted areas. Do moderate exercise for 2.5 hours a Week, some of it in the vigorous range. Do weight training or weight-free Exercises to strengthen muscles (combined with 30 grams of extra protein intake following the weight training).



AUTISM SPECTRUM DISORDER

Autism Spectrum Disorder, or ASD, is a complex developmental and neurological condition that typically appears during the first three years of life. It affects brain function, particularly in the areas of social interaction and communication skills. Classic symptoms include delayed talking, lack of interest in playing with other children, not wanting to be held or cuddled and poor eye contact. There is no known cause for ASD, but both genetics and environment are believed to play a role.



Characteristics of autism spectrum disorder fall into two categories.

- Social interaction and communication problems: including difficulties in normal back-and-forth conversation, reduced sharing of interests or emotions, challenges in understanding or responding to social cues such as eye contact and facial expressions, deficits in developing/maintaining/understanding relationships (trouble making friends), and others.
- Restricted and repetitive patterns of behaviors, interests or activities: hand-flapping and toe-walking, playing with toys in an uncommon way (such as lining up cars or flipping objects), speaking in a unique way (such as using odd patterns or pitches in speaking or "scripting" from favorite shows)

DIETARY PROTOCOLS FOR AUTISM

There is no one specific diet for autism that will fit every child. It's common for kids to have autism alongside other health issues such as allergies and intolerances. But there are two main steps that I take when working with a child with autism.

STAGE 1: INCREASING NUTRIENT STATUS

- The first step is always focusing on increasing their nutrition. This is not always easy, as a common symptom is picky and fussy eating. Many kids with autism will prefer bland, starchy foods that are highly processed and lacking in nutrients.
- When increasing nutrition in the diet, you need to consider the macronutrients and micronutrients.

BALANCING MACRONUTRIENTS

- Macronutrients are your proteins, fats and carbohydrates. Many kids with autism will prefer a carb-heavy refined diet. Rather than eliminating everything, I prefer looking at what we can add in to build their health up.
- By increasing quality protein and healthy fats, kids will stay fuller for longer. They will have steadier blood sugar levels, which can improve mood and behavior.
- Good protein sources include eggs, fish, nuts, legumes, chicken and high-quality meat. A good rule of thumb is to give them a serve the size of their palm at every meal.
- Good sources of fat include olive oil, avocado, nuts, seeds, eggs and coconut oil. Fish and seafood can also contain good fats, but can be tricky to add in with fussier kids.
- Finally, with carbohydrates, you want to switch to wholegrain and gluten-free grain options. Quinoa and rice have the bland, starchy flavor that kids with autism often prefer. Buckwheat can be a good alternative for sweet treats like pancakes.

INCREASING MICRONUTRIENTS

There are many vitamins and minerals that play a role in autism. But there are a few that I consider a priority in the majority of cases:

- **OMEGA-3S**

  A deficiency in omega-3s has been associated with autism. Research even shows that an enzyme deficiency occurs in autism, causing the removal of essential fatty acids from membranes. This means that kids with autism can churn through omega-3s quickly, needing more to make up for it. Fish and shellfish are two of the best sources. But many children with autism dislike these, so often a supplement is needed. Recommended dosage for stem cell patient is 1-1.5g per day.

- **ZINC**

  This mineral is essential for brain development and supports detox pathways. In autism, the detox pathways are often limited, working less efficiently than typical people. Zinc also plays an important role in maintaining gut health. Research has shown that supplementing with zinc can reverse brain changes that occur in autism. Recommended dosage for stem cell patient is 12-50mg per day.

- **VITAMIN D**

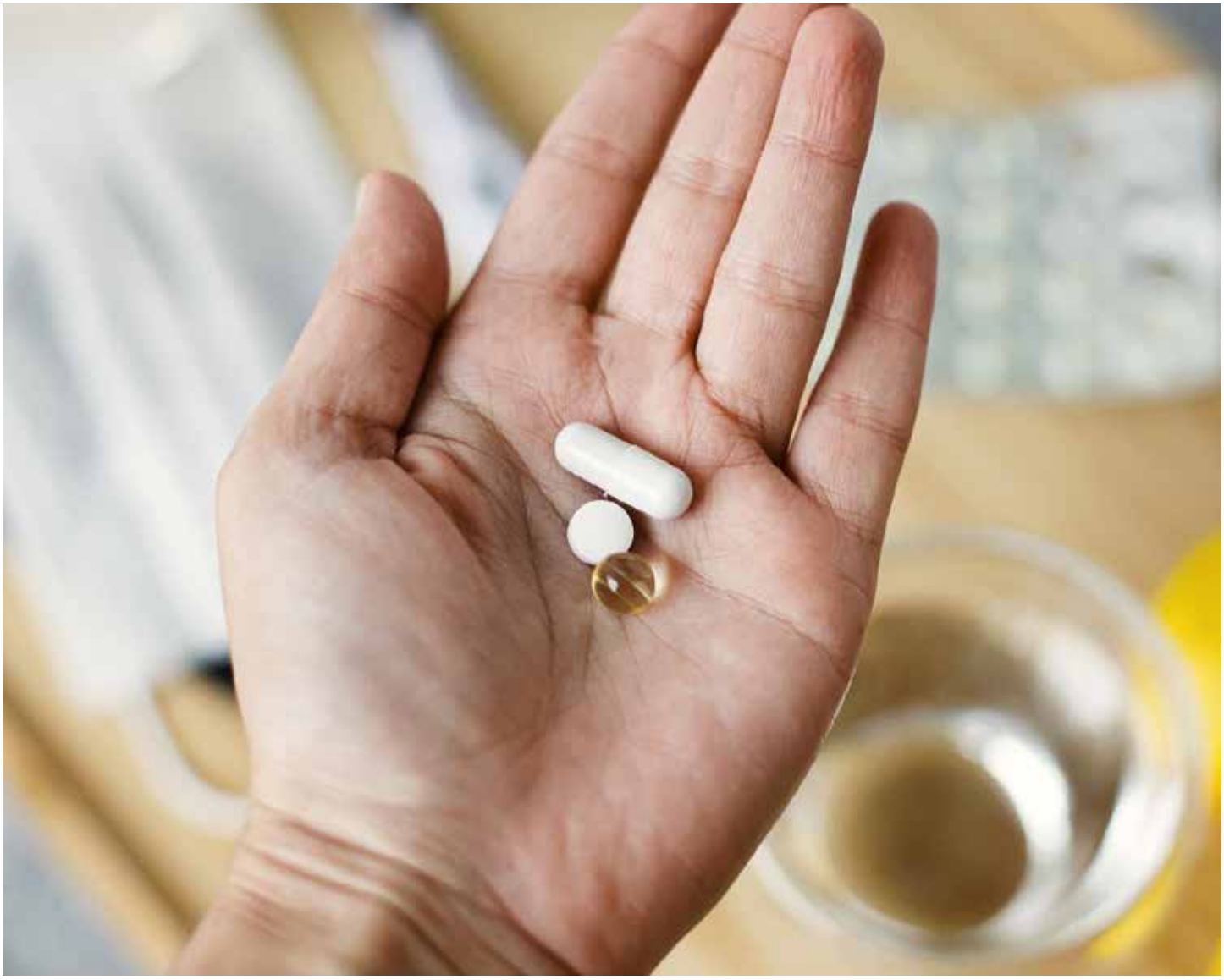
  This sunshine vitamin can reduce inflammation in the central nervous system. It supports the activity of brain chemicals, and also supports diversity in the gut flora. Supplementing vitamin D is often necessary, but you can go overboard. It's important to get levels tested before starting on high dosages. Recommended dosage for children is 2000IU. For adults it is 5000-10000IU per day.

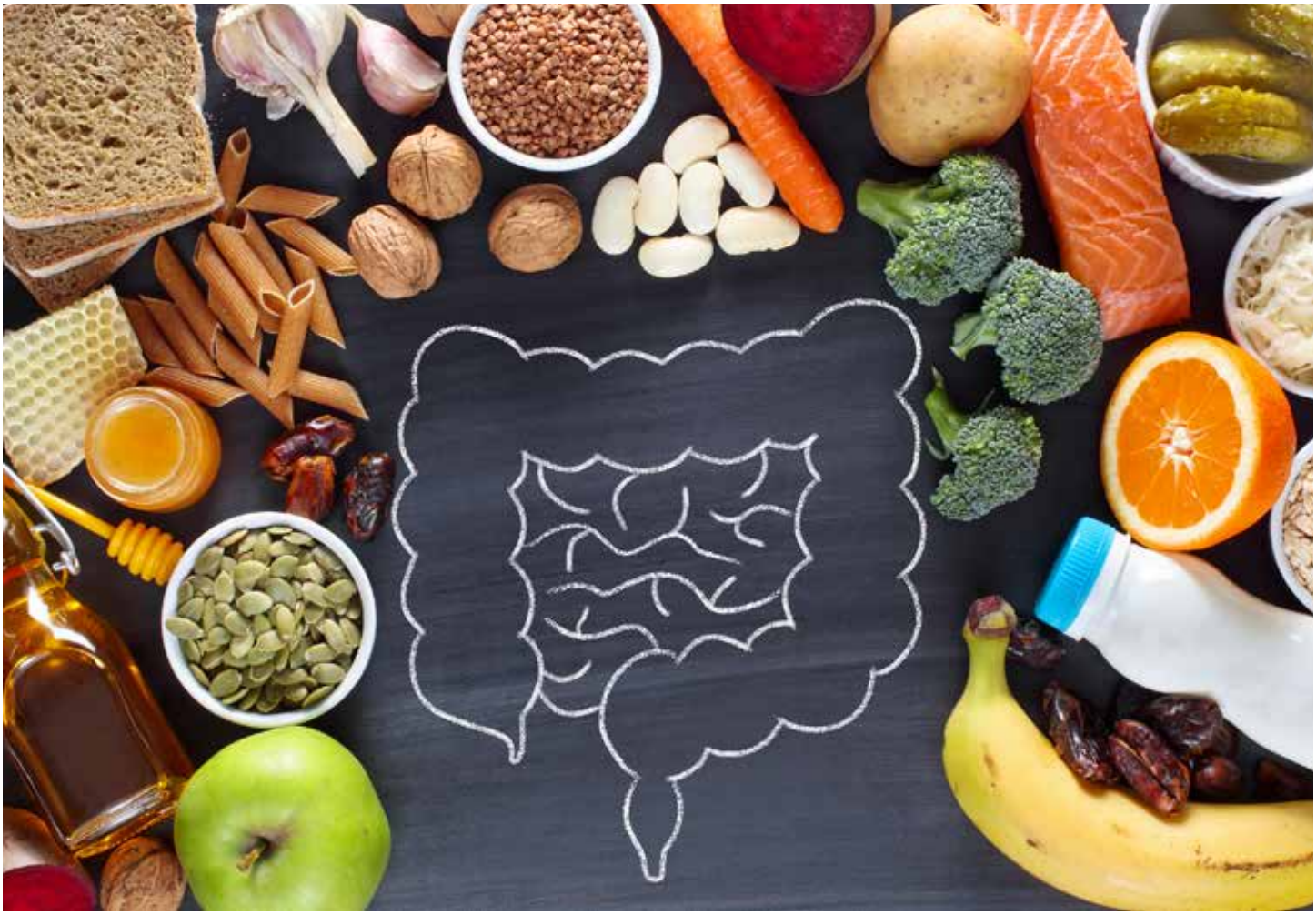
- **ACTIVATED FOLATE & B12**

  Activated folate and B12 – the methyl forms – are essential for methylation. This is a complex process that regulates things such as genes, nervous system development, detox pathways and immunity. Impaired methylation is common in autism, which makes an active form of these nutrients an important supplement to include. Recommended dosage is 500mg per day.

SUPPORTING GUT HEALTH

Like any health concern, gut health is an important consideration in autism. The gut flora can be thrown out of balance by the typical low-fiber, high carbohydrate diet that many kids with autism prefer. It is recommended 30 minutes prior to eating before breakfast. Recommended dosage for adults is 0.8g, 200billion cfu's per day & for children 0.1g, 25 billion cfu's per day. Stay at this dosage for about 3-5 days until symptoms improve.





STAGE 2: A GFCF DIET

If there is one elimination diet for autism to consider, it's GFCF – or gluten-free, casein-free diet. This diet involves eliminating all sources of gluten and dairy. Gluten is found in many grains and grain products including wheat, rye and barley. Casein is the protein found in all dairy products – including lactose-free, goat milk and A2 varieties.

WHY THESE TWO PROTEINS?

Some people, particularly those with autism, have problems breaking down these proteins. Instead of being fully digested, they are absorbed into the body and cross over into the brain. Here, they will bind to opioid receptors and affect a person's behavior, mood and even pain tolerance.

Sometimes, you need to do it step by step. For example, you might remove milk, waiting a few months, then remove wheat.

People with ASD often may repeat behaviors or have narrow, restricted interests. These types of behavior can affect eating habits and food choices, which can lead to the following health concerns.

- **Limited food selection or strong food dislikes.** Someone with autism may be sensitive to the taste, smell, color and texture of foods. They may limit or totally avoid some foods and even whole food groups. Dislikes may include strong flavored foods, fruits and vegetables or certain textures such as slippery or soft foods.
- **Not eating enough food.** Kids with autism may have difficulty focusing on one task for an extended period of time. It may be hard for a child to sit down and eat a meal from start to finish.
- **Constipation.** This problem may be caused by a child's limited food choices, low physical activity levels or medications. It typically can be remedied

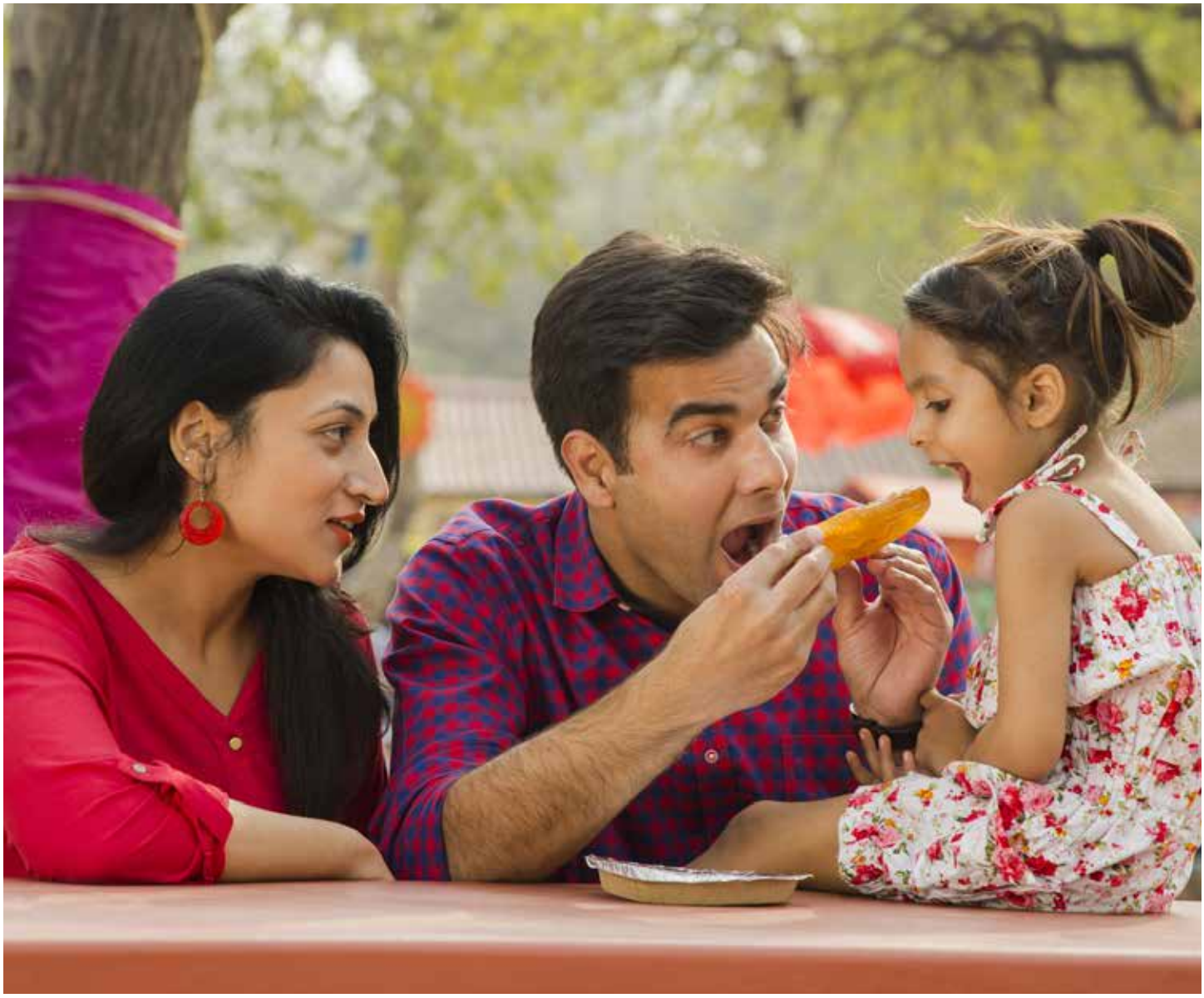
by gradually increasing sources of dietary fiber, such as bran cereals and fruits and vegetables, along with plenty of fluids and regular physical activity.

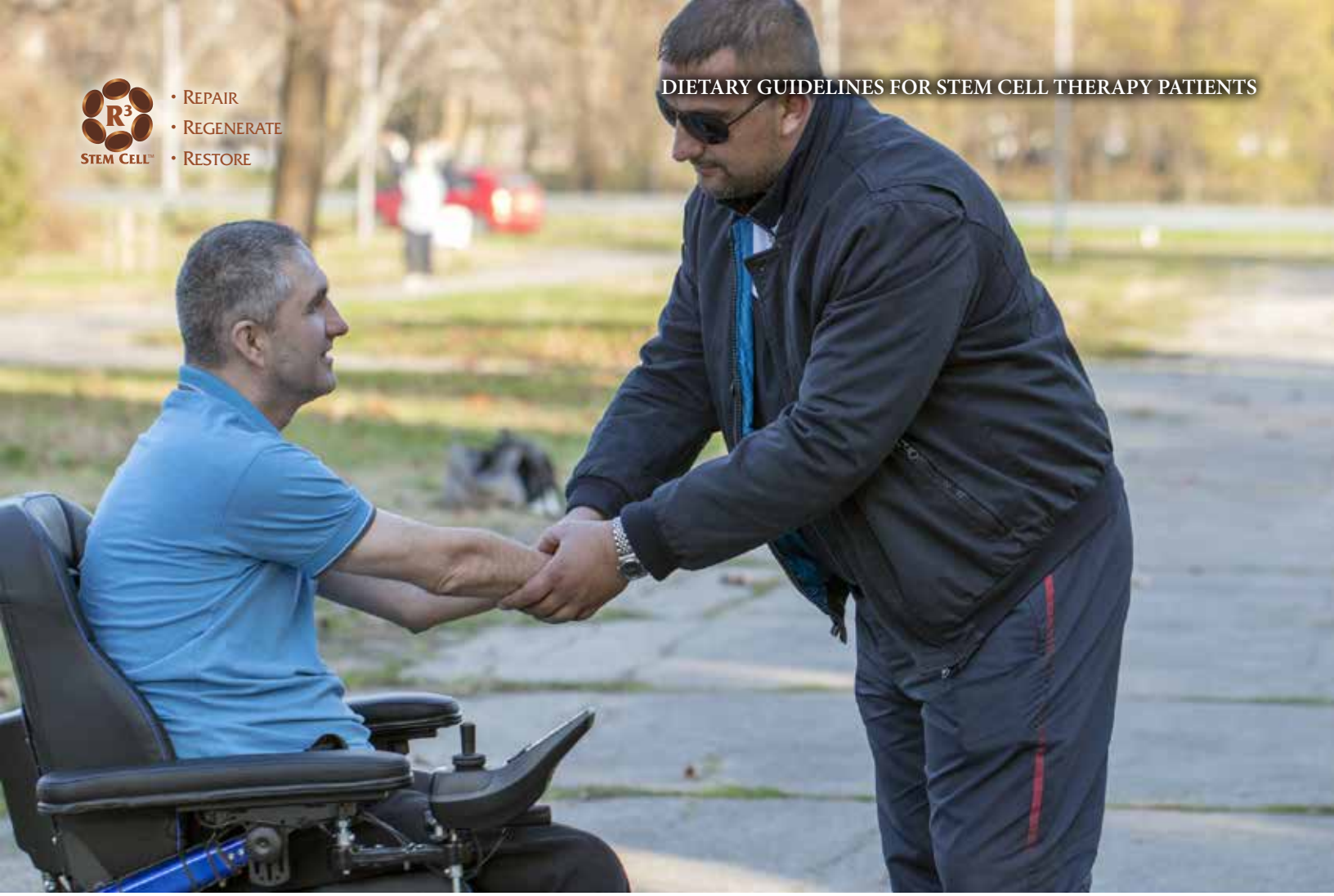
- **Medication interactions.** Some stimulant medications used with autism can lower appetite. This can reduce the amount of food a child eats, which may affect growth. Other medications may increase appetite or affect the absorption of certain vitamins and minerals. If your child takes medication, ask your healthcare provider about possible side effects.
- Be Prepared for Pickiness
- Make Mealtimes Routine

DIETARY PROTOCOL RECOMMENDED:

Keto Diet in a combination with gluten free diet

- MCT Oil preferably coconut oil
- Carbohydrates 20-25g /day
- Protein needs based on child age per weight & twice of RDA
- Remaining calories from fat
- 20% energy from MCT
- Increase water intake





CEREBRAL PALSY

Cerebral Palsy (CP) is a motor disorder associated with unusual or involuntary movements. The effects of cerebral palsy (CP) vary greatly from person to person. There is no cure for cerebral palsy, but there are a variety of treatments and therapies that can improve function and minimize pain. These range from therapies that can help optimize an individual's abilities, to surgical and medical interventions that can decrease symptoms of functional impairments and muscle tension.

Cerebral Palsy, 93%, will experience feeding difficulties. Since Cerebral Palsy results in impairment of muscle groups, facial muscles can be affected. The facial muscles are one of the strongest muscle groups in the body. Impairment hampers a child's ability to chew, suck, or swallow, thereby creating a high risk for undernourishment, failure to thrive, malnutrition, growth delay, and digestive difficulties. The following conditions are common in those with Cerebral Palsy:

- 86% experience oral-motor dysfunction
- 77% are diagnosed with gastro esophageal reflux
- 74% report chronic constipation
- 60% present with swallowing disorders
- 32% report abdominal pain

Other conditions include vomiting, chronic pulmonary aspiration, diarrhea, choking, drooling, flatulence, and pneumonia. The individual may take longer and experience discomfort when eating. He or she may also become sluggish from undernourishment, and dental problems may arise from excess drooling, longer meal times, or from stomach acids when aspiration occurs.

Those with Cerebral Palsy who may benefit from nutrition and dietary therapy include individuals with:

- Abdominal pain
- Aspiration
- Bladder control
- Bowel (intestinal) obstruction
- Bowel incontinence
- Chewing difficulties
- Choking

- Chronic pulmonary aspiration
- Constipation
- Delayed gastric emptying
- Delayed growth and development
- Dental caries/tooth decay
- Diarrhea
- Drooling
- Enuresis (bed wetting)
- Esophageal bleeding
- Esophagitis
- Failure to thrive
- Feeding difficulties
- Flatulence
- Gastro esophageal disease
- Gastro esophageal reflux (GERD)
- Gastrointestinal motility
- Gastrointestinal tract bleeding
- Genitourinary problems
- Growth impairment (maturation)
- Halitosis
- Immobilization
- Inadequate oral intake
- Incontinence
- Intestinal dysmotility
- Irritable bowel syndrome
- Malnutrition
- Obesity and weight management
- Oral motor dysfunction
- Pneumonia
- Primary intestinal pseudo obstruction
- Prolonged colonic transit
- Pseudo bulbar palsy
- Sucking difficulties
- Swallowing difficulties
- Undernourishment
- Urinary incontinence
- Urinary tract infections
- Vitamin deficiency
- Vomiting

How do those with Cerebral Palsy benefit from nutrition and dietary therapy?

With the majority of individuals with Cerebral Palsy reporting feeding or digestive difficulties, a dietary counseling program can be highly beneficial. Skilled practitioners work with primary care physicians to adjust diet, intake, substance, and supplements in ways that greatly contribute to an individual's overall total health. Most dietary concerns for those with Cerebral Palsy focus on how to prepare food, what to feed, how to feed, and when to feed.

Depending on the severity level of the individual's Cerebral Palsy, his or her digestive challenges and the ability to properly chew, swallow, and self-feed, effective dietary therapy can be devised to meet the individual's unique needs. Some of the more common dietary concerns for those with Cerebral Palsy include:

- Ways to prepare food- dietary practitioners can adjust textures and consistency of food by pureeing, chopping and grinding foods for a more palatable experience. Foods can be softened by adding broth, gravy, milk, or juices to accommodate constipation issues. Liquids can be thickened for ease in swallowing.
- Ways to feed- optimally, practitioners look for ways

a person can self-feed, a skill that greatly enhances quality of life. This may include training an individual to use adaptive equipment. However, when caregivers are needed to assist in feeding, practitioners can teach effective ways of doing so. This can involve appropriate space between servings to allow for natural swallowing, or feeding smaller portions more often throughout the day. In some cases, individuals with Cerebral Palsy must rely on a feeding tube for partial or total nutrition intake.

- When to feed- adjusting timing of meal times may involve smaller, more frequent meals throughout the day. Sufficient time is required between bites or drinks to allow for natural swallowing. Sometimes meals are scheduled around medication needs to avoid stomach upset, curve appetites, and address drowsiness.

- What to feed- if an individual with Cerebral Palsy has trouble with asphyxiation, reflux, or pneumonia, it is important to avoid foods that are more likely to exasperate these conditions, like nuts, seeds, and hard or stringy foods. Diets can be adjusted to provide more energy, balance metabolism, compensate for deficiencies, and enhance digestion. Vitamin, mineral and food supplements may assist those with malabsorption or who tire when eating. High fiber diets curb constipation. Prune and apricot juices may provide natural laxative qualities. Some foods enhance absorption of vitamins and calcium.
- Providing proper mouth care- drooling, aspiration, and long-term anti-seizure medication use can contribute to an increased risk of dental decay, cavities, gum disease, and bacterial infections. Dietary practitioners can substitute sugars and carbonation with fresh fruits and vegetables. They also consult dental specialists to encourage proper dental hygiene, which may include regularly brushing, drinking fluorinated water, and scheduling dental check-ups.

Most children with Cerebral Palsy will live well into adulthood. Industry experts have identified leading factors that can contribute to diminished life expectancy for those with Cerebral Palsy. Feeding has been cited as a contributing factor that can affect life expectancy. Others include mobility, cognitive functioning, vision, and self-care. Becoming aware of and managing these factors, including feeding issues, can positively affect the life span of an individual with Cerebral Palsy.

Nutrition therapy is typically applied in two phases – assessment and treatment.

The Ketogenic Diet for Children with Cerebral Palsy

There are a few diet plans that have proven to be beneficial to children with cerebral palsy. Details in each diet may be customized to fit the child's specific needs.

The ketogenic diet has been proven beneficial for children with cerebral palsy who experience frequent seizures. It consists of low-carb and high-fat foods. The high-fat foods cause ketosis, a condition where the ketones in the body increase. When this occurs, seizure activity decreases.

Types of Nutrients Children with Cerebral Palsy Need, but May Lack

From medications, associated conditions, and lifestyle, a number of children with cerebral palsy tend to lack the correct amount of nutrients needed to sustain health. Common nutrient deficiencies include:

Calcium

Around 99% of calcium is contained in the skeletal system. The rest of it has the important duty of controlling blood pressure, soft tissue function, and muscle movement. Calcium helps secrete hormones and control blood flow constriction and relaxation.

It is also necessary for muscle contraction. Many children and adults with cerebral palsy are diagnosed with osteopenia, a medical condition marked by fragile and weak bones due to a decrease in calcium. Recommended dosage is 200mg/day for infant to 1300mg /day for adults.

Magnesium

Magnesium plays an important role in producing energy, assisting in cell communication, synthesizing molecules, and helping children build strong bones. Most people are low in magnesium, but research suggests the people with cerebral palsy often more at risk for having low magnesium levels. Recommended dosage is 500mg/day.

Vitamin C

Many children with cerebral palsy suffer from mood swings, depression, and anxiety. It is possible that they may lack enough vitamin C to synthesize the norepinephrine neurotransmitter in the brain. Adequate amounts of vitamin C also help children battle common illnesses. Recommended dosage is 250-500mg twice daily.

Copper

Copper is an important trace mineral found in the brain, heart, kidneys, skeletal muscles, and liver. It helps increase iron absorption, maintain collagen, and ward off infections. Children with cerebral palsy are often low in copper, as well as manganese, a chemical often found in minerals with iron. Recommended dosage for copper is 500-1000mcg/day & for manganese it is 1.8-2.3mg per day.

Low copper and manganese levels can cause weak bones, neurological function issues, growth problems, and increase a child's risk of infection.

Getting your child to eliminate at least one unhealthy food is a positive way to teach good eating habits for life. For example, in November, eliminate any sugar-filled snacks and replace them with green leafy vegetables, fruits, whole grains, etc.

Keep Track of Your Child's Diet

Consider keeping a food diary to track your child's daily food and drink intake.

NEURODEGENERATIVE DISEASE

These disorders are debilitating conditions that impact neuron function and increasingly affect function throughout the disease course. While age is a major factor in the risk of onset, environmental factors also play a part. Adopting a nutritional approach for ameliorating symptoms of these disorders has already proven beneficial for some patients, and personalized nutrition strategies have been suggested

The most common neurodegenerative disorders are Alzheimer's disease (AD), Parkinson's disease (PD), and multiple sclerosis (MS). Neuron inflammation, oxidative stress, and mitochondrial dysfunction have all been noted in the progression of these diseases. While there is no cure for these disease states, clinical treatments for AD, PD, and MS symptoms may include medications, lifestyle modifications, and some other types of therapies. Lifestyle therapies may include specific foods, natural supplements, and diet plans. For example, with PD, each patient's treatment is personalized based on their symptoms and disease progression and may include nutrient support from.

- Antioxidants like vitamin C 250-500mg twice daily.
- Coenzyme Q10 (CoQ10) (100-200mg /day)
- B vitamins complex (400mcg-600mcg/day)
- Vitamin D (2000-10000IU/day)
- Resveratrol (500mg/day)
- Ginkgo biloba (240mg/day)
- An anti-inflammatory diet

In addition, specific nutrients such as omega-3 fatty acids and vitamin D, and specific diets such as the Mediterranean and ketogenic diets, have surfaced in recent neurodegenerative disease with suggested benefits of prevention, slowing disease progression, and improving quality of life for patients.

ALZHEIMER'S DISEASE:

With regard to AD, the most common form of dementia, many nutrients that act as antioxidants and anti-inflammatory agents may influence the mechanisms associated with the disease pathology. These include:

- Phenolic compounds (found in olive oil, turmeric, berries, etc.)
- Omega-3 fatty acids (found in fish, walnuts, etc.) (500-1000mg/day)

- Fat-soluble vitamins (Vitamin A (2000-3000IU/day), Vitamin D (5000IU/day), Vitamin E (400mg/day) , Vitamin K2 (100-300mcg/day).
- Isothiocyanates (found in cruciferous vegetables).
- Carotenoids (the orange, yellow, and red plant pigments)

Regarding vitamin D status and brain health, results from a 2019 meta-analysis indicated that vitamin D deficiency may be a risk factor for dementia or AD

MULTIPLE-SCLEROSIS

In addition to other factors such as age, low serum levels of vitamin D may also increase risk of MS development. As a treatment for MS patients, a 2020 review highlighted the potential benefits of vitamin D therapy, including a possible reduction in disease activity and severity. Omega-3 fatty acids and fish oil have also been investigated for slowing the progression of MS in adults, and a 2019 review of human studies concluded that these supplementations may reduce relapse rates and inflammatory markers and improve the overall quality of life for MS patients

The MIND diet, which is the Mediterranean diet in combination with the Dietary Approaches to Stop Hypertension (DASH) diet, is suggested to prevent neurodegeneration. In addition, specific foods and nutrients emphasized in the Mediterranean diet, such as olive oil, nuts, omega-3s, and carotenoids, have shown promise in improving AD patient outcomes. A ketogenic diet has also shown potential in animal and human studies for reducing symptoms for AD and PD patients due its neuroprotective properties. Since ketogenic diets are restrictive in nature, application of this diet strategy to the elderly population or patients with neurodegenerative disorders should be done with caution regarding sufficient nutrient intake and maintaining a healthy appetite.

Treatment Considerations & Practical Applications

Nutritional programs can have a dramatic effect on the prevention and treatment of neurodegenerative diseases. From reducing inflammatory markers and severity of symptoms to improving outcomes and quality of life, nutrition is an essential part of a patient's personalized clinical intervention for neurodegenerative diseases. A functional medicine strategy for prevention and treatment of neurodegeneration may include the following elements:

- Therapeutic food plans such as IFM's Mitochondrial Food Plan, which focuses on mitochondrial biogenesis.
- Nutritional support through dietary patterns and nutraceuticals that enhance specific antioxidant and anti-inflammatory agents.

In ketosis, the mitochondria burn fat instead of glucose for energy metabolism. Ketosis can be achieved through periods of fasting or by restricting the intake of carbohydrates in the diet, leading the body to break down fatty acids to produce higher-than-normal levels of so-called ketone bodies—acetoacetate,-hydroxybutyric acid, and acetone—through a process called ketogenesis, which occurs principally in the mitochondrial matrix in the liver. The "state of ketosis" has been shown to exert a protective action against neurological diseases like Alzheimer's disease (AD), Parkinson's disease (PD), amyotrophic lateral sclerosis (ALS), and more.

In AD and PD, single human studies have shown a reduction of disease symptoms in participants following a ketogenic diet. Such diets have been shown to stimulate mitochondrial biogenesis, improve mitochondrial function, and reduce oxidative stress. Medium-chain triglyceride–supplemented ketogenic diet (approximately 70% of energy as fat, including the MCT; 20% of energy as protein; and less than 10% of energy as carbohydrates).

CHRONIC KIDNEY DISEASE

Decrease in kidney function greater than 3 months is categorized as CKD.Risk factors of CKD include: Hypertension, Diabetes, Lupus, Rheumatoid Arthritis, and Anemia. Less potassium excreted more buildup in body result cardiac arrhythmia, Hypocalcaemia, Low vitamin D, Bone loss of Calcium & it can lead to renal osteodystrophy. CKD is divided into 5 stages depending on how well your kidneys are filtering. It can be mild, producing zero signs and symptoms at stage 1 or severe, causing hospitalization and requiring you to have a kidney transplant or go on dialysis at stage 5.

Obesity, diabetes, and high blood pressure risk factors for the development of kidney disease, and each of these risk factors can be managed by diet. So for people with kidney disease or who are at risk for developing kidney disease, maintaining a healthy weight and keeping diabetes under control are two of the most important things that they can do.

Diagnosis:

For normal kidney GFR must be 100-120ml/min/1.73m2.

For CKD, GFR less than 90ml/min/1.73m2 for at least 3 months.

Five stages of CKD:

Stage1: GFR<90ml/min/1.73m2

Stage2: Mild CKD, GFR = 60-89ml/min/1.73m2

Stage3: Moderate CKD (A) GFR = 45-59ml/min/1.73m2

Stage3: Moderate CKD (B) GFR = 30-44ml/min/1.73m2

Stage4: Severe CKD GFR = 15-29ml/min/1.73m2

Stage5: End Stage CKD, GFR<15ml/min/1.73m2

Is the Keto Diet Safe for Your Kidneys?

Similarities and Safe Aspects

Let's start with the safe aspects and similarities between a kidney-healthy way of eating and a keto diet. These are the aspects of the keto diet most people can safely follow and, frankly, are the keys to any healthy dietary pattern whether it's keto or vegan.

- Avoiding ultra-processed high carbohydrate foods like chips, pretzels, snack foods, candy bars, etc.

- Avoiding sugary drinks like soda, juice, sweetened tea, sugary coffee drinks, etc.
- Avoiding cookies, cakes.
- Cooking at home
- Limiting portion size
- Eating low carbohydrate vegetables

Keto Diet Protein Intake

1.2-1.7 grams/kg body weight/day

Chronic Kidney Disease (Stage 3-5) Protein Intake

0.6-0.8 grams/kg body weight/day

Water intake 64oz of water/day

On the other hand, we do know that people with kidney disease benefit from a lower protein intake. Most dietitians and doctors recommend between 0.6-0.8 grams of protein/kg of body weight for people with Stage 3-5 Chronic Kidney Disease. That's half as much protein as the typical keto diet.

Why Limit Protein in Chronic Kidney Disease?

Excess dietary protein has the potential to put extra stress on the kidneys. In the most simplistic explanation, the kidneys have to work extra hard to process protein once you eat above a certain amount. This extra work, also known as hyper filtration, can cause the tiny filters in the kidneys called glomeruli, to become scarred. If these filters get scarred, then kidney function can decline over time and kidney disease can worsen.

Other Differences:

• **Carbohydrates:** In a typical kidney-healthy diet, carbohydrates are often used to provide calories without giving extra protein. In the keto diet, carbohydrates are strictly limited.

• **Sodium:** A lower sodium diet often benefits people with chronic kidney disease because it assists with the management of high blood pressure and can prevent fluid retention. In the keto diet, extra sodium is often recommended, especially when you are starting out.

• **Plant-based proteins:** Recent research has suggested that plant-based protein may be better for people with kidney disease than animal protein. In the keto diet, there isn't a distinction between the two.

Keto can lower creatinine .Avoid sodium, salt, phosphate, potassium, carbohydrates & protein.

Kidney friendly veggies: Pepper, cucumber, cabbage.

Oil recommended for CKD patients include olive oil, avocado oil, and sesame oil.

If GFR drop below 25 only 0.6g/kg/day of protein is recommended.

Phosphorous: 800-1000mg/day (Restrict nuts, yogurt,seeds,cheese).

Potassium: 2000-3000mg/day.

Sodium: 1500-2000mg/day

Supplement recommended:

- Vitamin B6,B12,Folicacid (B-Complex)
- Iron (200mg/day)
- Vitamin C (500mg/day)
- Vitamin D (2000IU/day)
- Calcium (500-1000mg/day)

ANKYLOSING SPONDYLITIS

Ankylosing spondylitis is a type of arthritis that affects the spine and large joints. The best diet for Ankylosing spondylitis includes the Mediterranean diet or a diet rich in lean protein, vegetables and fruit that eliminates refined flour, sugar, alcohol and processed foods.

The anti-inflammatory and low starch, gluten and sugar free diet is proving to be useful for quite a few Ankylosing spondylitis (AS) patients (less inflammation and pain). However, patients with AS may eat anything that is usually considered healthy. They should stop a particular food only if it is suggested by the doctor. Apart from this, if they feel that any particular food they ingest is causing problems; they must monitor symptoms and then consult a doctor about eliminating such foods from their diet. Irrespective of whether people have AS or not, eating healthy food and maintaining a balanced diet (no junk) is essential for health and well-being.

Common food recommendations for patients suffering from Ankylosing spondylitis.

Reduce the following:

- Avoid any type of food made with refined flour and that is high in sugar. For example, bread, biscuits, white rice, cream, crackers, cakes, puddings and pies.
- Reduce intake of pasta, noodles, macaroni and pizza made with refined flour.
- Quit smoking. Smoking is particularly troublesome for people with Ankylosing spondylitis because the condition can affect the mobility of the rib cage.
- Avoid alcohol and any type of preservatives.
- Avoid foods that are high in sodium, such as chips and preserved and ready-to-eat foods.
- Increase the following:
- Eat plenty of protein, vegetables and fruit. The more colors on the plate, the better.
- Include any type of unprocessed meat at least once in the diet (fish, poultry, pork and lamb). Lean protein, such as fish and chicken, is the best.
- Increase the intake of all vegetables (cabbage, cauliflower,
- Sprouts, courgettes, peppers, mushrooms, spinach, broccoli or carrots).

- Include most of the available seasonal fruits in the diet.
- There are no restrictions on spices (pepper, salt or herbs).
- Blanched almonds, pine nuts and sesame seeds can be included in the daily diet.
- Increase the intake of foods rich in omega-3 fatty acids and vitamin D.
- Dietary supplements (especially vitamin D) might help individuals get the extra nutrients they are missing.
- The Mediterranean diet often shows promising effects in individuals suffering from AS.
- Foods that may need to be checked:
- Start by eliminating all dairy products for two months.
- If this doesn't help, experiment with the elimination of wheat, corn, soy, sugar and citrus fruits one at a time.

Patients who experience limited relief through medications should try diet and lifestyle changes. A few studies indicated that the Ankylosing spondylitis may be caused by altered gut flora. Improved immune function and remodeling of the gut microbiome by taking probiotics and a healthy diet ought to work as a cure for some people.

DIABETES

Type 2 diabetes is a condition that impacts blood sugar control. A person can manage the condition by following a healthful diet and maintaining a healthy body weight. A ketogenic diet is a high-fat, moderate protein, very low-carbohydrate diet that may help some people in supporting blood sugar. Every person has different dietary needs. Doctors now individualize diet plans based on current eating habits, preferences, and a target weight or blood sugar level for that person.

Foods containing carbohydrates, such as bread, rice, pasta, milk, and fruit, are the main fuel source for many bodily processes. The body uses insulin to help bring glucose from the blood into the cells for energy. However, in a person with diabetes, insulin is either absent or does not work properly. This disrupts the body's ability to use carbohydrates effectively and, in turn, causes sugars to be high in the blood.

If a person eats a high-carb meal, this can lead to a spike in blood glucose, especially in a person with diabetes.

Diet is important for both type 1 and diabetes. Limiting the intake of carbohydrates is the central concept of the keto diet.

The ketogenic diet and diabetes:

The ketogenic diet severely restricts carbohydrates. It forces the body to break down fats for energy. The process of using fat for energy is called ketosis. It produces a fuel source called ketones. A ketogenic diet may help some people with type 2 diabetes because it allows the body to maintain glucose levels at a low but healthy level.

The lower intake of carbohydrates in the diet can help to eliminate large spikes in blood sugar, reducing the need for insulin. Studies on ketogenic diets, including research from 2019, have found that they can be helpful in controlling levels of HbA1c. Ketogenic diets may help reduce blood sugar levels. As such, some people with type 2 diabetes who also follow a ketogenic diet may be able to reduce their need for medication. Hypoglycemia occurs when blood sugar levels fall to 70 milligrams per deciliter (mg/dL) or less.

The ketogenic diet helps the body burn fat. This is beneficial when a person is trying to lose weight, and it may be helpful for people whose excess weight has influenced the development of pre-diabetes and type 2 diabetes. Even light-to-moderate weight loss through diet and exercise might support glycemic control, overall well-being, and energy distribution throughout the day in people who have diabetes,

Research has shown that people undertaking a ketogenic diet show an improvement in blood sugar. Trusted Source level management and that some have experienced noticeable weight loss.

The ketogenic diet can lead to a variety of other benefits including:

- Lower blood pressure
- Improved insulin sensitivity
- Reduced dependency on medication
- Improvements in high-density lipoprotein (HDL), or "good" cholesterol, without adding to low-density lipoprotein (LDL), or "bad" cholesterol
- A drop in insulin

Ketogenic diets are strict, but they can provide ample nutrition when a person follows them closely and is mindful about meeting nutrient needs.

- The idea is to stay away from carbohydrate-rich foods that could spike insulin levels. Typically, the carbohydrate intake on a keto diet ranges from 20–50 grams (g) per day.
- To follow the keto diet, people should try to develop a diet plan in which 10%Trusted Source of the calories come from carbohydrates, 20% come from protein, and 70% come from fat. However, there are different versions of the diet, and proportions vary depending on the type.
- They should avoid processed foods and focus instead on natural foods.
- A ketogenic diet should consist of the following types of food:
- Low-carb vegetables: A good rule of thumb is to eat non-starch vegetables at every meal. Beware of starchy vegetables, such as potatoes and corn.
- Eggs: Eggs are low in carbohydrates, as well as being an excellent source of protein.
- Meats: Fatty meats are acceptable, but should be eaten in moderation to be mindful of heart health. Also, be mindful of consuming too much protein. Combining a high level of protein with low levels of carbohydrates may cause the liver to convert the protein into glucose. This would raise blood sugar levels.
- Healthful fat sources: These include avocados, olive oil, nuts, and seeds. Although the diet is mostly fat, it is important and recommended to include mostly healthy fats over not as healthy options such as bacon, sausage, red meat, and fried cheeses.
- Fish: This is a good source of protein.
- Berries: These are good sources of fiber, vitamins, minerals, and antioxidants that are okay to consume on the keto diet in the right quantity.
- Supplement recommended include vitamin D(5000IU/day), fish oil (1000mg/day), chromium(200mcg/day), magnesium(500mg/day), vitamin B12 (500mg/day).

RHEUMATOID ARTHRITIS

Rheumatoid arthritis, or simply RA, is an autoimmune disease that causes the body's immune system to attack healthy cells as if they were foreign invaders. This causes swelling, pain, inflammation, and redness in the joints and surrounding tissue.

The exact cause of RA is not understood but appears to be related to genetic and environmental factors. This disease affects more women than men and typically shows up in those between the ages of 40 and 60. RA is a very complex issue and can have crippling pain for many. Less than 1% of those who have been diagnosed with the disease will go into remission. Certain lifestyle factors may be able to improve your chances of remission or at least lessen symptoms associated with RA.RA involves the accumulation of inflammation in and around the joints caused by a chronically elevated immune response. A typically beneficial and protective mechanism of the immune system, in this case, turns into a damaging force.

There are numerous other holistic ways of improving rheumatoid arthritis symptoms including:

- Reducing stress
- Consuming foods and herbs high in anti-oxidants
- Supplementing the diet with omega-3's (1000mg/day)
- Supplementing with Vitamin D(5000IU/day) and K2 (200mg/day)

In addition to the recommendations above, I believe that there is still another way to help control many of the symptoms and pain that RA patients deal with on a daily basis. Much of the pain that RA patients feel comes from inflammation. If inflammation can be controlled, then it follows that pain could also be controlled. To a large degree, your nutrition plays a role in inflammation levels in the body. This is why it is possible to design an effective rheumatoid arthritis diet. In particular, a ketogenic nutrition plan may be able to provide several benefits.

A ketogenic diet may be an effective rheumatoid arthritis diet not only by helping control weight through accelerated fat loss – but by also providing a substantial reduction in inflammation levels. The keto diet can vary, but generally speaking, it calls for a consumption of 65-75% of calories from fat, 20-30% from protein, and only 5-10% from carbs.

Benefits of Ketogenic Diet

A ketogenic lifestyle can be the perfect rheumatoid arthritis diet because shifting into a state of fat-burning has several benefits in the body. The primary two benefits that would offer those with RA relief are:

- A reduction in inflammation due to improved mitochondrial energy production from fats (as opposed to sugars)
- A reduction in excess stress on the joints and ligaments if weight loss is achieved

Additionally, a ketogenic diet also eliminates virtually all sugar, gluten, grains, and several other common inflammatory foods. I take an additional step and remove some other common keto foods that I have seen clinically be more likely to provoke more autoimmune symptoms. This special autoimmune focused keto diet is a powerful way to reduce inflammatory symptoms.

Keto as RA Diet:

Patients with RA have their lives changed simply by changing their diet. Lifestyle adjustments and supplements often help promote healing even further.

Weight Loss & RA

A strong link has been established between obesity and the heightened risk of developing RA. For those who are overweight and have RA already, promoting weight loss will have a very relieving effect. Because of these considerations, a ketogenic diet is likely a great strategy to both prevent and improve RA .While physical activity is generally desirable for those with RA, being overweight can make it very painful. Luckily, a ketogenic diet can improve weight loss even in the absence of exercise. **Once the excess weight is lost, then exercise may be reintroduced with much less pain.**

Healthy fats:

It should make up the bulk of your diet. Not only do they provide a fuel that your body can convert into ketones, but they are an important component of your cells. Not many people realize this, but healthy fats also serve as a transport vehicle for several nutrients like Vitamins A, D, E, and K. The combined effect of these nutrients ensure bones remain strong and inflammation is kept at bay. Saturated fats like grass-fed butter and coconut oil are some of the best options. Other great sources of fat include pastured meats, avocados, olive oil, and MCT oil.

Protein:

The best sources of ketogenic protein are things like pastured meats, organ meats and bone broth. A high-quality plant-based cleansing protein powder like this one can also be great. Finally, if you are someone who is highly active and trying to build lean body mass, essential amino acids are an excellent keto companion.

Non-Starchy Vegetables:

Vegetables are a crucial part of a rheumatoid arthritis diet. While healthy fats should make up the majority of calories on this nutrition plan, plant matter should make up a large physical volume of each meal. Non-starchy vegetables are full of anti-inflammatory nutrients and provide the digestive tract with prebiotic fiber. This fiber nourishes the bacteria in the gut which helps promote healthy digestion. Poor digestion and an inflamed gut are both primary sources of inflammation that can be addressed on this diet.

The list of vegetables includes celery, leafy greens, broccoli, cabbage, cauliflower, peas, green beans, cucumbers, asparagus and all types of lettuce.

Fruits:

Since fruits are high in sugar (even if it is natural sugar) they should be eaten only in moderation. Look for low glycemic fruit such as berries, green apples, and grapefruit. Blueberries and dark cherries are some of the best options but keep the servings low (about ½ cup).

Bone-Building Foods:

When it comes to rebuilding your bones, tendons, and ligaments – calcium is not really what you need. In fact, most people have plenty of calcium. The issue is that it is not going to the right place. This is because certain nutrients like vitamin D, vitamin K, and magnesium all play a role in calcium deposition. Bone broth, in particular, is excellent for nourishing the soft tissues that can become damaged in RA – such as the synovial fluid in joints.

Supplements:

- Antioxidants Herbs
- Vitamin D (5000IU/day)
- Vitamin K2 (200mcg/day)
- Omega3 Fatty acids (1000mg/day)

Others depend upon condition.

OSTEOARTHRITIS

OA commonly affects the large joints such as the knees and hips but frequently occurs in the hands, the base of the big toe and the spine. It is a condition that affects the whole joint, where cartilage breakdown and inflammation can lead to pain, discomfort and a reduced quality of life.

In the UK, it is the fastest growing cause of disability. OA may run in families or can develop as a result of injury. It largely affects people later in life and obesity is a major risk factor. There is currently no cure for OA, so treatment options are generally limited to the management of pain and symptoms. There are a number of dietary strategies that may help you to ease its symptoms.

Maintaining a healthy weight

The most important relationship between diet and OA is weight. Not only does being obese or overweight increase the strain on joints, but excess fat causes inflammation which can exacerbate symptoms. There is strong evidence that losing weight can reduce pain and improve physical function and mobility.

If you are overweight or obese, losing ten per cent of your body weight will give optimum benefit, not only for symptoms but for overall health. This can be achieved by eating a healthy diet. Incorporating exercise helps to maintain muscle while losing weight. OA has been linked to type 2 diabetes and cardiovascular disease; losing excess weight will also help to prevent or manage these conditions.

Fats Consumption

The long-chain omega-3 polyunsaturated fatty acids found in oily fish have anti-inflammatory properties that may well be of benefit in OA. Aim to consume at least one portion of oily fish a week, preferably two, e.g. sardines, mackerel and salmon. If this is not possible, consider a trial of fish-oil capsules; one to two capsules should supply 450 mg EPA+DHA per day.

Although, strictly speaking, this is not enough to produce anti-inflammatory effects, it is the dose that improved pain and function in a trial on knee OA patients and the dose recommended for reducing cardiac death. Omega-6 polyunsaturated fats (found in sunflower, corn and grapeseed oils) are somewhat pro-inflammatory so may make symptoms worse, as may saturated fats. Replace them by oils and spreads rich in mono-unsaturated fats such as olive oil.

Cholesterol reduction

OA patients are more likely to have raised blood cholesterol than those without OA. There is some suggestion that lowering blood cholesterol will improve OA. In any case, if blood cholesterol is raised, it is important to make dietary changes to lower it – this will also benefit cardiovascular health. Collective dietary measures include:

- 2g/day of plant stanols/sterols - these can be found in proprietary fortified drinks, spreads, and yogurts
- reducing the intake of foods high in unsaturated fat
- increasing the intake soluble fibers
- eating nuts (30g /day)
- Consuming soy protein (25g /day) e.g. tofu, soy milk, soy beans /edamame beans.

Antioxidants

Antioxidants, found in certain animal and plant products, protect the body from damaging oxidation, so-called 'oxidative stress' which may be involved in the development and progression of OA. Antioxidants that may be relevant include vitamins A, C and E.

The importance of vitamin

Vitamin D is essential for bone and cartilage health. Studies have shown that it may have a positive effect on muscular strength and balance. However, most people consume only small amounts in their diet.

Vitamin K may influence OA through its role in making bone and cartilage. Although evidence of benefit in OA is suggestive but currently limited, there is some suggestion that increasing vitamin K may be of benefit to those who are deficient, hence it is important to obtain it as part of a healthy balanced diet. Certain fats and oils (e.g. olive oil, margarine) contain small amounts of vitamin K and may also help its absorption from foods.

Key nutritional and lifestyle recommendations for OA

- Aim for a healthy BMI, i.e. between 18.5 and 25 kg/m2.
- If you are overweight or obese, take action to reduce your body weight by ten per cent.
- Regular exercise is likely to help symptoms by preserving muscle strength.
- Consume one to two portions of oily fish a week. If you cannot do that, consider trialing a fish-oil supplement (≥ 1.5 g fish-oil/ day).
- Use oils rich in mono-unsaturated (e.g. rapeseed oil and olive oil).
- Take dietary action to reduce your blood cholesterol, if elevated.
- During the summer months, aim for daily sunlight exposure (ten to 15 minutes without sunscreen) to increase vitamin D.
- Take a vitamin D supplement of 5000-10000IU /day, when there is no sun exposure.
- Consume rich sources of vitamin K2 (200mcg/day) and the antioxidants, A, C, and E as part of a healthy balanced diet.
- Researches show that glucosamine (1000-1500mg/ day), chondroitin sulphate (500mg/day), rose hip or turmeric(500mg/day) help OA symptoms.

If you are overweight or obese, combining regular exercise with healthy eating to achieve weight loss is the most effective strategy to reduce joint pain. Increasing intake of long-chain omega-3 fatty acids and reducing blood cholesterol may be of some benefit and will improve cardiovascular health.

David Greene, MD, PhD, MBA
Founder/CEO

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