

# When Self Is The Enemy: Autoimmune Inflammatory Diseases

By John G. Clark, M.D.

“How long will he have to live in that bubble?” David Vetter, born with a dysfunctional immune system had lived in a sterile plastic “germ-free isolator” world all of his life. The question was; when would science deliver on its quest, through some new technological advance, to find a solution to David’s dilemma? If allowed to encounter the environment, the one we live in every day, David would most certainly pick up a pathogen that would end his life. Even NASA got involved! Top engineers put their heads together and crafted a most eloquent space suit for David. But after a few forages out into the real world, David’s fears of contamination, microbes and death drove him back to his reclusive spot at Baylor University Medical center. David finally died when an attempt to solve his life threatening condition with a tissue transplant operation, failed to resolve his immune system deficiency.<sup>1</sup>

If we did not have an immune system, we like David, would die. But where did our immune system come from? “I will praise thee; for I am fearfully and wonderfully made: marvellous are thy works; and that my soul knoweth right well.”<sup>2</sup>

## The Advantage Of An Immune System

The skin is our first line of defense. “Every square inch of human skin consists of 19 million cells, 60 hairs, 90 oil glands, 19 feet of blood vessels, 625 sweat glands, and 19,000 sensory cells that can transmit information at more than 200 miles an hour.”<sup>3</sup> What’s more, immune cells of the skin secrete antibodies that can stop invaders. And not just from the skin of our bodies, antibodies from the immune system emerge to protect the nose, sinuses, throat, lungs, stomach and intestines. With out these antibodies from the immune system, we’d all be doomed.

After the skin, our next line of defense centers in our immune systems ability to mount an all out counter attack to invaders, and I do mean counter attack. These invaders can be identified or unidentified. If the immune system identifies them (has had experience with them before) then it can deal more specifically and carefully with them. If the immune system has never seen them before, then it gets out the big guns and shoots anything that seems out of place. As long as this line of defense only destroys invaders we are happy. This line of defense is called inflammation. It is especially active to deal with any new injury, antigen, bacteria or virus.

## Friendly Fire: Why Autoimmune Inflammatory Disease?

A compromised immune system cannot deal with infections and antigens in its usual healthy way, consequently it resorts to inflammation. Tissue damage often occurs as the body attempts to rid itself of disease.<sup>4</sup> When the only weapon available is a sledgehammer, collateral damage is sure to occur. Autoimmune inflammatory diseases arise under several situations where the immune system is not able to function most efficiently. Inflammation can occur when: the immune system is not in optimal health, the immune system is confused by hostile antigens, the immune system is overstimulated, the immune system’s inflammatory process is secretly triggered, or the immune system is overpowered by oxidative stress or other sources of inflammation. A few examples of autoimmune inflammatory diseases that occur under these conditions are: rheumatoid arthritis, polymyalgia rheumatica, psoriasis, ankylosing spondylitis, polyarteritis nodosa, scleroderma, inflammatory bowel disease, ulcerative colitis, Crohn’s disease, irritable bowel, some cases of type I diabetes, fibromyalgia, multiple sclerosis, systemic lupus erythematosus, allergy, chronic fatigue and asthma, etc.

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## WHAT PERTURBS THE IMMUNE SYSTEM

The list of what brings down the immune system so that it resorts to primitive means of defending the body could be very long. We will try to point out some of the ones most common and the most dangerous, rather than giving an exhaustive list.

### The Aging Immune System

As we age our immune system tends to lose its acuity making autoimmune inflammatory diseases more likely.<sup>5</sup> Now you may be thinking, “There is nothing I can do about aging!” But, as you will discover, aging can be influenced for better or for worse.

### Stressing The Body’s Defenses

Stress essentially drives the immune system to suicide. Emotional stress or job “burn out” provokes inflammation, increasing the risk of cardiovascular disease and autoimmune inflammatory disease.<sup>6</sup> Having experienced major stressful life events within the last 2 years increases the risk of developing an autoimmune inflammatory disorder 140%.<sup>7</sup>

### Anti-Oxidants

A deficiency of anti-oxidants favors oxidative stress. Oxidative stress kills cells; the immune system then makes anti-bodies to their spilled DNA.<sup>8</sup> Many autoimmune inflammatory diseases are identified by the presence of anti-DNA antibodies.

### Heavy Metal Blues

Heavy metals increase the body’s inflammation, increasing the risk of autoimmune inflammatory diseases. Top heavy metal villains include lead,<sup>9</sup> mercury, beryllium, nickel, chromium, cobalt,<sup>10</sup> cadmium, and vanadium.<sup>11</sup> Mercury increases inflammatory tissue damage by 50%.<sup>12</sup>

### The Drugged Immune System

Many drugs are known risk factors for these diseases. For example estrogens: estrogens enhance the release of inflammatory mediators from white cells in the immune system.<sup>13</sup> Oral contraceptive use increases autoimmune inflammatory disease risk by 90%.<sup>14</sup> Hormone replacement therapy increases autoimmune inflammatory disease risk 150%.<sup>15</sup> Pharmaceutical drugs are not the only source of these hormones. Chemicals and animal products are also big sources of hormone and hormone like substances that can cause autoimmune inflammatory disorders.

### Better Living Through Chemistry?

There are many chemicals, especially in some work environments,<sup>16,17</sup> which increase the risk of autoimmune inflammatory disease.<sup>18</sup> For example, hair preparations, especially dyes, increase the risk of an autoimmune inflammatory disease by 90%.<sup>19</sup> Another culprit is Sodium Lauryl Sulphate (SLS), which breaks down the body’s barriers to antigen invasion and it also causes inflammation.<sup>20</sup> SLS is the most common major ingredient in shampoo’s, toothpaste and other personal care items.

What are you eating? Food preservatives, such as BHA (3-tert-butyl-4-hydroxyanisole),<sup>21</sup> and additives, such as emulsifiants, thickeners, surface-finishing agents and contaminants like plasticizers can trigger inflammation in the body.<sup>22</sup>

Do you eat crackers with soup? The stomach’s job is to produce acid for the digestion of food. When alkali substances such as baking soda / powder are ingested, as found in crackers, many biscuits and cakes, the stomach has to work twice as hard to achieve the same level of acidity. Baking soda / powder intake is associated with a 190% increase in risk of stomach cancer, a cancer often the result from increased stomach acidity, irritation and inflammation.<sup>23</sup>

Toxins and waste products are eliminated through the skin. People avoid jobs that provoke sweat and as a result skin pores become clogged with waste. Consequently a greater burden is placed on the liver, bowels and kidneys to dispense of these. This leads to increased inflammation and

increased skin, liver, bowel and kidneys disease. Good skin hygiene helps combat inflammatory disease.<sup>24</sup> Good skin hygiene may involve thorough scrubbing, brushing and sweating.

### Would You Like That Fresh Or Rotten?

Can you find a good banana in a dumpster? Aflatoxins, formed in the process of aging or fermenting,<sup>25</sup> are a source of inflammation.<sup>26</sup> Dietary sources of aflatoxins include: cheese,<sup>27</sup> wine, vinegar, and any food created by rotting or fermentation. Scientist use weak vinegar solutions to cause inflammatory bowel disease in rats as a model for studying ulcerative colitis and Crohn's disease in humans.<sup>28,29</sup> What's more, chemicals formed when foods are pickled<sup>30</sup> increase oxidative stress, inflammation,<sup>31</sup> autoimmune disease and cancer.<sup>32,33</sup>

Another source of aflatoxin exposure is the environment. Mold in the environment increases the risk of autoimmune inflammatory: 180% for the lungs<sup>34</sup> and 360% for joints.<sup>35</sup> Shade trees and shrubbery close and dense around a house, water-damaged buildings,<sup>36,37,38,39</sup> decaying leaves,<sup>40</sup> compost heaps,<sup>41</sup> sauna baths, wet basements, swamps and lowlands--all sources of aflatoxins and inflammation. Avoid all decay both personal and environmental.

### Perfect Health Depends On Perfect Circulation

Inflammation increases when blood flow is congested and slowed.<sup>42,43,44,45</sup> As a result autoimmune inflammatory diseases are more likely with a sedentary lifestyle, tight clothing or cold extremities. On the other hand, when circulation is quickened, inflammation decreases.<sup>46</sup>

In cold weather, wearing short sleeves or short pants exposes the limbs to cooling, chilling the blood back from the extremities to the chest, abdomen and pelvis where inflammation can set in. Additionally the circadian rhythm (your internal equilibrium clock which controls the balance between inflammation and anti-inflammation) is disrupted,<sup>47</sup> inflammatory mediators are released,<sup>48,49</sup> and the risk of autoimmune inflammatory disease increases.

Studies show that tight clothing has a negative effect on the body. From slowed digestion of food to increased inflammatory mediators, tight clothing is sure to increase ones risk of autoimmune inflammatory disease.<sup>50,51</sup>

Another way in which circulation is unbalanced, and can be the source of inflammation, is through overwork of the brain. Over work of the brain in the absence of good outdoor physical exercise results in increased inflammation. Inflammatory diseases are significantly more prevalent in those doing mental work compared to those involved in physical labor.<sup>52</sup>

### Sleeping Off The Disease

Sleep loss is associated with increased inflammation and autoimmune disease.<sup>53,54,55,56</sup> Many of the things that we are discussing affect sleep quality and therefore also affect the risk of disease.

### Air Quality Control

Indoor air has far more contaminants than outdoor air. Indoor air contaminants are a source of inflammation. Contaminants include: breathable dust, nitrogen dioxide, chemicals such as formaldehyde, aspergillus aflatoxins and various molds.<sup>57</sup>

### Don't Let This One Get Out Of Hand

Some causes of autoimmune inflammatory disease start small and increase with time to something bigger than expected. Improper use of the voice,<sup>58</sup> voice strain,<sup>59</sup> shallow or improper breathing<sup>60,61</sup> can all cause inflammation of the lungs and throat increasing the risk of autoimmune inflammatory diseases.

Repetitive or forceful tasks cause tissue microtraumas leading to inflammation that can spread to the whole body<sup>62</sup> increasing the risk for autoimmune inflammatory disorders.<sup>63,64,65</sup>

### Condiments and Spices

Strong dietary condiments and spices can be the source of inflammation leading to autoimmune disease. Mince pies, cakes, preserves, highly-seasoned meats with gravies, pickles, excessive salt, grease, pepper, mustard, and ketchup etc.

Excessive salt intake increases hypertension and renal injury caused in part by oxidative stress and inflammation in the kidneys and blood vessel walls.<sup>66,67</sup>

Red and black pepper significantly increase the stomach's acidity leading to cell destruction, microbleeding, and inflammation.<sup>68</sup> Red pepper increases stomach acid excretion 700%.<sup>69</sup>

### Stimulants

What about caffeine? Caffeine and its relatives increase the risk of acquiring an autoimmune disease. Once inflammation starts in the body, caffeine can accelerate it by 300%-600%.<sup>70</sup> Chocolate increases the risk by 150%, cola drinks by 120%<sup>71</sup> and coffee 118%.<sup>72</sup>

Does alcohol impair the immune system? Alcohol consumption increases free radical formation and whole body inflammation.<sup>73</sup> Wine can be especially aggravating, worsening such inflammatory diseases as asthma.<sup>74</sup>

Smoking (even secondhand smoke)<sup>75</sup> causes increased inflammation thereby using up the body's protective anti-oxidant resources. Toxic fumes and caustic chemicals from burning tobacco increase the risk of acquiring an autoimmune inflammatory disease.<sup>76,77</sup> The risk of acquiring an autoimmune inflammatory disease increases 65% with smoking and 98% with alcohol consumption.<sup>78</sup>

### Food And Autoimmune Inflammatory Disease

Notice that we have been writing about a lot more than just diet. Diet is important, but there is a whole lot more to autoimmune disease than just diet.

### Snack Attack!

Fried potatoes, salty snacks, desserts and processed meats are among the top instigators of elevated oxidative stress and whole body inflammation.<sup>79</sup> Can you name one snack food that is healthy?

### Western Diet Woes

A number of studies have identified the western diet, (described variously as including; red meat, processed meat, pork/hot dogs, butter, lard, hydrogenated fats, high saturated fat, high-fat dairy, eggs, french fries, potatoes, regular and diet soft drinks, pizza, refined grains, breads and pastas, coffee and tea, sweets/candy and desserts), as increasing the risk of autoimmune inflammatory diseases by as much as 210%.<sup>80,81,82</sup>

### The Key Is To Eat Your Protection

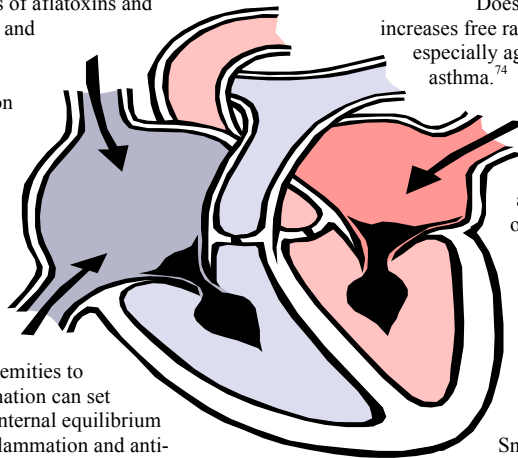
Patients suffering from autoimmune inflammatory disease have significantly lower blood anti-oxidants levels.<sup>83,84</sup> Studies also show that commercial supplements are of no value in correcting this deficiency.<sup>85</sup> Proper diet is the only solution to poor nutrition and reducing the risk of autoimmune inflammatory disease.<sup>86</sup>

### Fiber: Start Roughing It

Patients suffering from autoimmune inflammatory disease can also have significantly lower fiber and magnesium intakes. Fibrous foods are usually higher in magnesium. Fiber and magnesium deficiency are associated with a 300%-400% elevation in inflammation.<sup>87</sup>

### Mineral Depletion Is A Global Issue

The amount of magnesium in all foods has decreased by 19% in the last 50 years.<sup>88</sup> Low levels of zinc,<sup>89</sup> selenium,<sup>90</sup> and magnesium<sup>91</sup> are associated with increased inflammation. Whole wheat flour has 530% more magnesium, 320% more zinc, and 110% more selenium than white flour.<sup>92</sup> Pumpkin seeds are a rich source of zinc and Brazil nuts are a good source of selenium.



## Doughnut Despair

Doughnuts are a huge source of advanced glycation end products! Carbohydrates fried with oil accumulate advanced glycation end products (AGEs), toxins that activate the body's inflammatory mediators.<sup>95,94</sup> AGEs can also be formed in the body if the blood sugar becomes elevated. A slice of 100% whole wheat bread has 536 AGEs units,<sup>95</sup> while a plane-glazed doughnut weighs in at a whopping 425,740 units of AGEs.<sup>96</sup>

## High-Fructose Is High Risk

Fructose (in all its forms, e.g. high fructose corn syrup) activates inflammatory mediators in the liver<sup>97</sup> and blood vessels<sup>98,99</sup> increasing the risk for autoimmune inflammatory disease.

## Risk Management

The results of a study that came out of Israel help put things in perspective. Dietary choices that increase autoimmune inflammatory disease risk include: sugar (430% increased risk), cholesterol (360%), eggs (350%), saturated fat (animal fat, 310%), soft drinks (300%), and vegetable oil (22%).<sup>100</sup>

## Fat and Cholesterol

Dietary cholesterol is especially harmful.<sup>101</sup> Cholesterol provokes the immune system to increase inflammation.<sup>102,103</sup> A high cholesterol diet more than triples the risk of autoimmune inflammatory disease.

High fat food is at greater risk for lipid oxidation or peroxidation. Cheese is high in fat and is created by decay, thus it is high in oxidized lipids (fats). These oxidized cheese lipids significantly increase the risk of autoimmune inflammatory diseases.<sup>104,105</sup>

Butter significantly increases oxidative stress by stimulating the immune cells to produce inflammation when there is no other reason to be causing inflammation.<sup>106</sup>

High fat diets increase body inflammation.<sup>107</sup> Of special concern are trans-fats that significantly increase the inflammatory responses of the body. Saturated fat, as found in animal products and tropical oils such as palm oil, have been shown to increase the body's inflammation.<sup>108</sup> Compared to a diet predominating in monounsaturated (vegetable) fat, eating a high saturated (animal) fat diet increases body inflammation 270%.<sup>109</sup> What's more animals fed a fatty diet develop a high rate of autoantibodies (antibodies against ones own self),<sup>110</sup> a classic finding in autoimmune inflammatory diseases.

Of special concern are oils that have been become oxidized. Oxidized oils pose an immediate and long-term threat to body anti-inflammatory reserves heightening the risk of multiple autoimmune inflammatory diseases.<sup>111,112</sup> Oxidized oils are common to deep fat fryers, fried foods, and packaged foods with a long shelf history.

Cooking food in oil (frying) produces trans-fat,<sup>113</sup> acrylamide<sup>114</sup> and lipid peroxidation.<sup>115,116</sup> These byproducts of frying are all stimulators of inflammation leading to increased risk of autoimmune inflammatory disorders.<sup>117</sup> Trans-fat can also be found in hydrogenated and partially hydrogenated vegetable oils, margarines and shortening.

Oxidized cholesterol promotes tissue inflammation and cell death leading to atherosclerosis (inflammatory heart disease) and autoimmune inflammatory disease.<sup>118</sup> Common sources of oxidized cholesterol are: spray dried egg powders (such as found in pancake mixes), Parmesan cheese, butter oil, ice cream, sausages and beef tallow. Oils and cholesterol are especially apt to oxidation when heated in the presence of air for a longer period for example in deep-frying at fast food restaurants.<sup>119</sup>

## Same Foods Everyday?

Eating the same foods day after day overwhelms the body's food tolerance mechanisms and can result in food allergy and/or autoimmune inflammatory disease.<sup>120</sup>

## Enriched!

A diet high in refined carbohydrates negatively affects the balance of free radical generation and antioxidant defense leading to inflammation overload.<sup>121,122,123</sup> A breakfast consisting of a bowl of corn flakes with skimmed milk, a piece of toast and a glass of orange juice converts almost instantly to 16 teaspoons of sugar. Sixteen teaspoons of sugar will increase

the body's oxidative stress and inflammation by 240%.<sup>124</sup> A can of soda has 12 teaspoons of sugar.

Refined grain products, (e.g. white bread, white rice, white pasta), tip the body's oxidant / anti-oxidant balance toward oxidation, increasing inflammation and the risk of autoimmune disease.<sup>125,126</sup>

## The Gluten Connection

Patients with autoimmune inflammatory diseases have a high incidence of sensitivity to wheat gluten, as high as 10 times higher than normal individuals.<sup>127</sup>

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## Animal Antigens

Individuals with autoimmune inflammatory disease show higher than normal sensitivities to animal product antigens: 1200% higher for dairy, 600% for eggs, 460% for pork, and 400% for fish.<sup>127</sup> If you have autoimmune disease or know you should be taking precautions to avoid autoimmune inflammatory disease it might be prudent to stay away from these sources of disease.

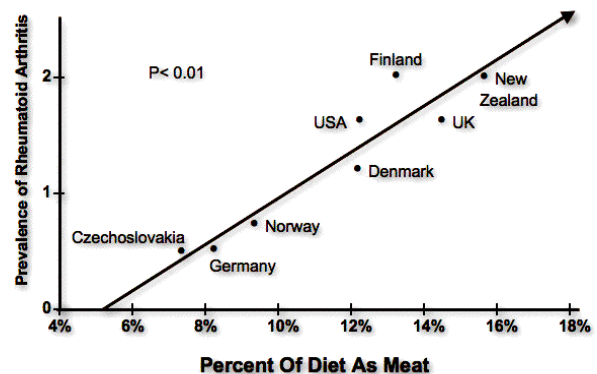
## More On Milk

The link between dairy and autoimmune inflammatory diseases is multifactorial.<sup>128,129</sup> milk is immunosuppressive,<sup>130</sup> it has many hormones which increase disease risk,<sup>131</sup> milk is the source of many infectious agents (viruses and bacteria) that precipitate autoimmune inflammatory disease,<sup>132</sup> it contains many antigens which initiate the autoimmune process,<sup>133,134,135,136</sup> and milk provokes and aggravates<sup>137</sup> the inflammatory process.<sup>138</sup>

## Go Big Red

Why is red meat red? Heme iron makes red meat red and red cells red. Heme iron increases the body's sensitivity to oxidative stress and inflammation.<sup>139</sup> Consumption of red meat increases the risk of autoimmune inflammatory disease by 130%.<sup>140</sup> Epidemiological studies comparing the amount of meat eaten in countries around the world with how much autoimmune inflammatory disease the have show that with increased meat consumption there is increased disease.<sup>141</sup> The message of course is, if you need an autoimmune inflammatory disease, eat more meat.

## Meaty Statistics



Br J Nutr. 2000 Nov;84(5):589-95.

## Protein Portions

Many people these days are worried about whether or not they are eating enough protein in their diet. It is a bit of a mania. In fact it is actually

hard to achieve a low protein diet. Protein, eaten in excess of body needs, increases the risk of autoimmune inflammatory diseases by 190%.<sup>140</sup> (For more information on protein, please refer to our handout and presentation on osteoporosis.)

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#### Variety, The Spice Of Life?

Most people in developed countries like to eat a large variety of food at each meal as though they had to balance their entire life's nutritional requirements at one sitting. Excessive antigenic load, as encountered in a complex meal comprised of multiple diverse foods, can provoke autoimmunity, allergy and inflammation.<sup>142</sup>

#### Eat To Live, Or Live To Eat?

Another instigator of the autoimmune inflammatory process is overeating. Overeating provides fuel for a bigger fire than can be healthfully managed. Excessive caloric intake is associated with increased body oxidative stress<sup>143</sup> and increased incidence of autoimmune inflammatory diseases.<sup>82</sup> On the other hand reduced caloric intake decreases autoimmune inflammatory disease risks.<sup>144</sup>

#### Weight Management

For the avoidance of these diseases, carrying extra weight is not ideal. Studies show that whole body inflammation increases with increasing body weight.<sup>145,146</sup> Being overweight increases the risk of acquiring an autoimmune inflammatory disorder by 275%.<sup>147</sup>

As a person gains weight, fat tends to gather about the abdomen. While much of this fat is external, a large portion of it is also internal, around the organs. This internal fat is termed organ or visceral fat. Visceral fat is another source of inflammation<sup>148</sup> and oxidized fat. For each 1% increase in visceral fat, the risk for increasing inflammation goes up an additional 140%.<sup>149</sup>



#### A Case Of Mistaken Identity

Worms: could there be a case of mistaken identity? Trichinellosis, a parasite acquired from eating pork and bear, is associated with increased inflammation.<sup>150,151</sup> Musculoskeletal symptoms include muscle pain, joint pain, muscle weakness, and restriction of joint movements.<sup>152,153</sup>

Trichinellosis is not the only infection implicated in autoimmune inflammatory conditions. Viral and bacterial infections are being implicated more and more in the development of autoimmune inflammatory diseases.<sup>154,155,156,157</sup> Autoantibodies increase with the number of infections a person has suffered in their lifetime.<sup>158</sup> Numerous infectious agents, including Salmonella,<sup>159</sup> E. Coli, Streptococcus and Mycobacterium,<sup>160</sup> have been linked to autoimmune inflammatory diseases. The most abundant source of these infectious agents is animal products.<sup>161,162,163,164,165</sup>

#### Needling The Immune System

There are some risky behaviors that may need to be avoided. One of these, about which more and more scientific evidence is emerging, is vaccination. For example receiving measles, mumps and rubella vaccine (MMR) vaccination significantly increases the odds of acquiring chronic inflammatory arthritis.<sup>166</sup> Compared to receiving the common tetanus vaccine: receiving a hepatitis B vaccine increases the odds of acquiring multiple sclerosis by 420%, systemic lupus erythematosus by 810%, and rheumatoid arthritis by 1700%.<sup>167</sup>

#### Exercise

It has been said, "If you don't find time to exercise, you will have to find time to be sick." When one sits around, its like a car idling; smoke and fumes build up. For the sedentary individual, inflammation builds up, increasing the risk for autoimmune inflammatory disease.<sup>168</sup>

#### Strict Schedule

How regular are you? I mean in your schedule? Studies show that extended and irregular shift work confers an increased risk of contracting an autoimmune inflammatory disease.<sup>169</sup>

#### OUTCOME OF PERTURBING THE IMMUNE SYSTEM

Once the immune system becomes off balance it can really fall a long way from normal resulting in signs and symptoms that culminate in autoimmune inflammatory disease. Besides all the well recognized autoimmune inflammatory diseases listed earlier there are other unhappy outcomes to letting the immune system fall into disarray. We will list just a few.

The presence of an autoimmune inflammatory disease is a good sign that the immune system is probably going to have trouble performing its usual function with success. Most autoimmune disease is associated with immune suppression or dysfunction. People with autoimmune inflammatory disorders are 85% more likely to acquire serious life threatening infections. The most common sites of infection include, joints, skin, soft tissues and the lungs.<sup>170</sup>

Despite increased medical treatment options, patients with autoimmune inflammatory diseases do not enjoy lengthy lives.<sup>171</sup> Pneumonia, tuberculosis, and liver disease are significantly increased as causes of death in these patients.<sup>172</sup>

Chest pain: should autoimmune inflammatory disease patient be worried? Inflammatory disease not only affects bones, connective tissue and joints, but blood vessels and heart muscle as well. Patients with autoimmune inflammatory disease are 90% more apt to have congestive heart failure,<sup>173</sup> 95% more likely to die of sudden cardiac arrest, and 220% to have a heart attack.<sup>174</sup>

Many autoimmune inflammatory disease patients suffer from osteoporosis, (thinning of the bones), making them more susceptible to fractures. The inflammatory process involved in autoimmune disease is also a major player in osteoporosis.<sup>175</sup> Many of the medications with which autoimmune inflammatory disease are treated also cause osteoporosis.

Cancer is also often the result of a deficient immune system. Immunity is a function of white blood cells. As a consequence of inflammation and immune compromise, the risk of leukemia (blood cell cancer) increases 150%.<sup>176</sup>

#### RESTORING AND MAINTAINING THE IMMUNE SYSTEM

Let's change gears now and talk about how to restore a failing immune system and maintain it in a condition to assure the avoidance of further inflammatory disease, its complications, and its pain.

#### Fresh Morning Air

Occupations involving physical work in the open air are protective, while working in artificial, air conditioned environments increase the risk of contracting an autoimmune inflammatory disease.<sup>177,178</sup> One of the most effective immune boosters is an early morning walk in the fresh air near a body of water as the sun is just coming up.<sup>179</sup>

#### Have You Seen The Smiling Sun Recently?

Sunlight exposure reduces inflammation in the body.<sup>180,181,182</sup> Sunlight exposure is a major source of vitamin D.<sup>183</sup> Vitamin D deficiency increases the risk of many common cancers, multiple sclerosis, rheumatoid arthritis, hypertension, cardiovascular heart disease, and type I diabetes.<sup>184</sup> It is recommended that at least 25% of your skin be exposed to the sunlight for 20 minutes each day, and longer if you have darker skin.

#### What About Exercise?

"But I can't exercise, I have pain!" you may be thinking. Exercise tips the inflammatory / anti-inflammatory balance in favor of reduced inflammation and reduced disease risk.<sup>185,186,187,188</sup> With few exceptions,

sufferers of autoimmune inflammatory diseases benefit significantly from physical activity, which leads to significant improvements in strength, pain, and fatigue without making the disease worse.<sup>189,190,191,192,193</sup>

As individuals age their immune systems declines. Being physically fit helps to slow this decline. The immune system responds positively to moderate exercise, while too much exercise tends to suppress it.<sup>194</sup>

While you are out exercising, as I know you will be, loose clothing is of greater benefit than clothing that restricts movement and blood flow. Tight clothing has been shown to interfere in body temperature variations, blood flow and hormone levels, factors implicated in autoimmune inflammatory disease.<sup>195</sup>

### Circadian Rhythms: The Bodies Internal Clock

Our bodies run on clocks. The anti-inflammatory / inflammatory balance cycles on a clock called your circadian rhythm.<sup>196,197</sup> The anti-inflammatory circadian clock malfunctions when: meal times are varied or meals are taken late in the evening,<sup>198,199</sup> sleeping times are varied,<sup>200</sup> insufficient or shifted to a late bedtime and/or late rise time, a job requires shift work where daily schedules vary on some days, such as on days off or weekends.<sup>201</sup> Regularity in sleeping hours improves overall sleep quality and anti-inflammatory effect. For the autoimmune inflammatory patient, we recommend a strict schedule for sleeping hours with a set nightly bedtime no later than 9:30 p.m., and a set regular rise time between 7.5 and 8 hours later on all weekdays and weekend days.<sup>202</sup> We recommend regular mealtimes every day of the week not varying by more than 5 minutes with no meal later than 5:30 p.m.<sup>197</sup> We recommend regularity in exercising every day of the week including days off and weekends.

### Dietary Choices

A study was performed comparing four diets: (1) fats and processed meats diet (fats, oils, processed meats, fried potatoes, salty snacks, and desserts)—the western diet, (2) beans, tomatoes, and refined grains diet (beans, tomatoes, refined grains, and high-fat dairy products)—a Mediterranean like diet, (3) vegetables and fish diet (fish and dark-yellow, cruciferous, and other vegetables)—sea food diet, and (4) whole grains and fruit diet (whole grains, fruit, nuts, and green leafy vegetables)—vegetarian vegan diet. The western diet raised three markers of inflammation, the Mediterranean diet raised one marker of inflammation, the seafood diet lowered one marker of inflammation and the vegetarian vegan diet lowered four markers of inflammation; showing the superiority of the vegan diet in addressing autoimmune inflammatory diseases.<sup>203</sup>

inflammatory vitamins and phytochemicals. Another advantage to the vegetarian diet is its high content of natural anti-oxidants. Studies show that patients suffering from autoimmune inflammatory diseases eat significantly fewer anti-oxidant foods.<sup>209</sup> On the other hand studies show that high anti-oxidant intake decreases the bodies inflammation.<sup>210</sup>

There is a real advantage to eating fruit and vegetables. Fruits and vegetables are high in flavonoids,<sup>211</sup> phytochemicals and anti-oxidants that have been found to lower the oxidative stress, inflammation and oxidation of lipids (fats) in the body.<sup>212</sup> Fruits and vegetables are high in vitamin A. Deficiency in vitamin A leaves the body unguarded against oxidative stress and autoimmune inflammatory disease.<sup>213,214</sup> Good sources of vitamin A include sweet potatoes, carrots, kale, spinach, winter squash, cantaloupe and broccoli.

Whole grains and fiber are also a part of an autoimmune inflammatory disease fighting diet. Diets high in whole grains have been shown to have a protective effect against systemic inflammation reducing the risk of autoimmune inflammatory disease.<sup>215,216</sup> Fiber, as found in whole grain products and bran, reduces inflammation in patients with inflammatory disorders.<sup>217</sup>

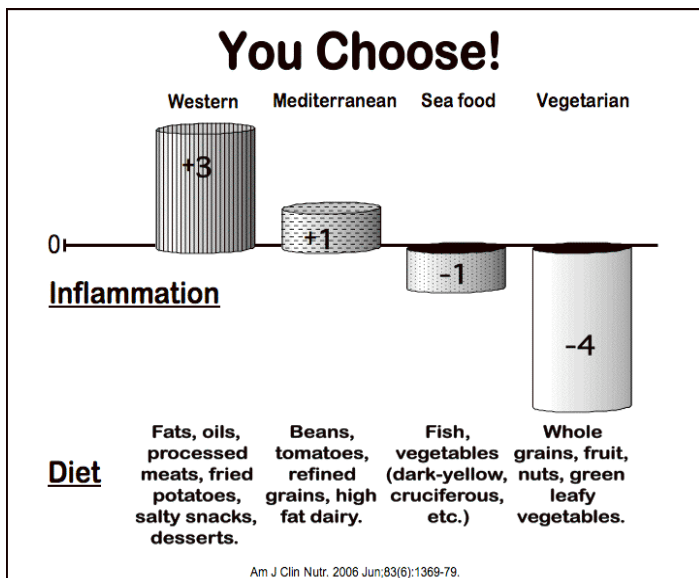
What about a “low carb” diet for reducing inflammation? To the contrary, low fat, high carbohydrate diets have been shown to significantly reduce whole body inflammation.<sup>218</sup>

What diet provides the maximal amount of anti-oxidant, anti-inflammatory benefits? Fresh food, that taste of Eden, is most effective. Fresh food is an uncooked vegan diet consisting of berries, fruits, vegetables and roots, nuts, germinated seeds and sprouts, i.e. rich sources of carotenoids, vitamins C and E, (some call this a “raw food” diet). People on a fresh food diet have been shown to enjoy improvements in symptoms of autoimmune inflammatory disease including: pain, joint stiffness, quality of sleep, health quality, cholesterol and weight management.<sup>219,220</sup>

Another consideration is the health benefits of omega-3 fatty acids. Omega-3 fatty acids are associated with decreased inflammation, improvement in disease symptoms and reduced risk of acquiring autoimmune inflammatory disease.<sup>221,222</sup> Good sources of omega-3 fatty acids are a vegetarian diet, olives, and flax seed. Olives and olive oil, with their high levels of anti-oxidants, omega-3 fatty acids and phytochemicals, have been found to be helpful in the prevention and treatment of autoimmune inflammatory disorders.<sup>223,224,225,226</sup> The most preferable way to obtain the olive oil is from the eating of whole olives. Results are not immediate but usually felt within 12 weeks.<sup>227</sup>

Another single food we want to mention is lemon juice and citrus. Citrus contains many bioflavonoids, phytochemicals, and anti-oxidants that have been found to reduce inflammation<sup>228,229,230</sup> and improve symptoms of autoimmune inflammatory disease.<sup>231,232,233</sup>

We mentioned that too much protein has deleterious effects for the would-be autoimmune inflammatory disease survivor. But not all proteins are created equal. Soy protein reduces the risk of autoimmune inflammatory disease by 60% compared to a diet high in animal protein.<sup>234,235</sup>



### Vegetarian Advantage

A vegetarian diet has been found to have an anti-inflammatory effect on patients with active autoimmune inflammatory disease.<sup>204,205,206,207</sup> A vegetarian diet stimulates the immune system, improves tolerance to noxious antigens found in less ideal diets,<sup>208</sup> and is loaded with anti-oxidant anti-

## Are you a python? Do you swallow your food whole?

### Chew Your Food

Are you drinking juices or slurping smoothies? Are you a python? Do you swallow your food whole? A better method is to chew your food well and savor every bite. The immune tissue in the mouth and throat (tonsils), tests substances coming into the body to let the body know what is food.<sup>236,237,238,239,240</sup> Allergy and autoimmune inflammatory diseases are more likely to flair up when food is not chewed long and well, when the body has not had a chance to recognize the antigens.<sup>241,242</sup>

### Temperance: Abstinence From Things Harmful, Moderation In Things Good

A program designed to benefit patients with autoimmune inflammatory disease will most surely include methods for eliminating the use of such stimulants as tea, coffee, caffeine, tobacco and alcohol.

Another aspect of temperance is the eating moderate amounts of food. When more calories are consumed than are needed, inflammation increases. On the other hand, reducing calorie intake reduces the body’s inflammatory responses.<sup>243,244</sup> The goal is to match caloric intake to body energy needs.

Taken a step further, fasting is a quick way to get an energy imbalance under control.<sup>245</sup> Fasting has been found to reduce oxidative stress and inflammation, and improve symptoms of autoimmune inflammatory disease.<sup>246,247</sup>

The outcome of caloric restriction could have another desirable result for some; that being weight loss. Being overweight is associated with increased risk of autoimmune inflammatory disease. Weight loss is associated with a decrease in oxidative damage to lipids (fats) and proteins and decreased inflammation.<sup>248,249,250</sup>

#### Water Consumption: I'll Drink To That

Studies show that optimal water intake can lower the risk of autoimmune inflammatory diseases by as much as 60%.<sup>100</sup> On the other hand, dehydration (being low on water) enhances the inflammatory response of the body to hostile antigens.<sup>251</sup> We recommend 8-12 eight ounce glasses per day.

What water should I drink? We have a saying: "friends don't let friends drink tap water." Contaminated water is also a source of inflammation.<sup>252,253</sup> Water should be obtained which is pure and free from all substances, which can potentially induce inflammation. Depending on your water condition, filtering, distilling or other treatment may be necessary.

Drinking it is not the only beneficial use of water. Many people have discovered the benefits of hydrotherapy; the use of water for treatment of disease and maintenance of health. Acute inflammatory pain can be treated with either superficial heat for reducing guarding (fear and tensing) or with cold for reducing pain.<sup>254</sup> The application of heat or cold to inflamed joints tends to improve pain, joint stiffness and joint function. The application of cold tends to raise the pain threshold.<sup>255</sup> Contrast (alternating hot and cold) hydrotherapy tends to improve circulation, greatly lowering inflammation.<sup>256,257</sup>

#### Avoiding The Obvious

The avoidance of heavy metal exposure is key to reducing the risk of and/or symptoms of autoimmune inflammatory disease. If a high level of exposure has been experienced in the past, it may be necessary to take steps to eliminate these toxins from the body.

#### Vaccination Burnout

Repeated over stimulation of the immune system, as in immunizations, can result in immune fatigue and burnout resulting in increased risk of autoimmune inflammatory disease.

#### Should I Do A Cleanse?

When toxin accumulation is the cause of immune dysfunction, toxin elimination may be the only way to get the immune system back in balance. Sweating, something we don't like to do in this day and age, may be just what is needed to expel the aggravating toxins.<sup>258</sup> Skin brushing (exfoliation) can also be a part of this elimination process. Chelation is another effective way to get rid of especially heavy metals.<sup>259</sup> This can often be accomplished with dietary modifications. Sometimes a diet totally devoid for a while of the toxin to be expelled can accomplish the same goal.<sup>260</sup> Some have even found a colon cleanse beneficial.<sup>261</sup> I knew of a patient who was successful at managing their inflammatory arthritis if they did a colon cleanse once a quarter (which made me wonder what they were doing the rest of the time to pollute their colon again).

Another useful modality for the removal of toxins and inflammation is charcoal. Charcoal can be used for inflammation as an oral supplement,<sup>262</sup> and as a topical treatment.<sup>263,264</sup> Studies show that it is effective in reducing the symptoms and signs of autoimmune inflammatory disease.<sup>265</sup>

#### Mind Body Connection

Trust in Divine power: spirituality is associated with less depression and increased feelings of health in patients with autoimmune inflammatory disease.<sup>266,267</sup> Studies reveal that religious intervention such as intercessory prayer increases immune function, improves rheumatoid arthritis, and reduces anxiety.<sup>268</sup> In a study of autoimmune inflammatory patients, six hours of one-on-one intercessory prayer was associated with significant overall improvement in disease that lasted the entire subsequent year of the study's duration.<sup>269</sup>

Given the relationship between stress and autoimmune inflammatory disease, stress reduction should be a priority with autoimmune disease sufferers.<sup>270,271</sup> The dietary changes we advocate have also been found to reduce the psychological symptoms of stress.<sup>272</sup> Improved spiritual health has been shown to be a valuable aid in stress management.<sup>273</sup> Has not God said, "Come unto me, all ye that labor and are heavy laden, and I will give you rest."<sup>274</sup> He is the great burden bearer; trusting in Him alleviates stress.

#### In Summary

As you engage in an autoimmune inflammatory disease recovery program you will find it helpful to **eliminate** all:

- Animal products including dairy and eggs.
- Possibly wheat gluten.
- Oxidized oils or cholesterol.
- Refined foods: sugars, starches, grains, and oils.
- Excess dietary calories.
- Foods or drinks created by aging or fermentation.
- Stimulants: coffee, tea, tobacco and alcohol.
- Strong irritating spices.
- Excess body weight.
- Tight clothing and clothing that does not provide adequate and evenly distributed warmth.
- Excessive meals (fasting may be helpful).

As you engage in an autoimmune inflammatory disease recovery program you will find it helpful to:

- Have a regular schedule throughout the day for sleep, meals and exercise.
- Eat a whole plant food diet with plenty of fresh fruits and vegetables, omega-3s and fiber.
- Chew your food thoroughly and swish it around your mouth.
- Make use of pure water: drink plenty, bath often, and perform hot and cold treatments.
- Make wise application of charcoal as poultices and taken by mouth.

And what dietary program are we really talking about? The original Bible diet! Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food." "And you will eat the plants of the field."<sup>275</sup> Should it be any surprise that the Maker of this marvelous immune system, which is designed to protect this marvelous body we have been given, should have the best lifestyle prescription necessary for its upkeep?

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