# Artemisinin, Artesunate, Artemisinic Acid and Other Derivatives of Artemisia Used for Malaria, Babesia and Cancer

A Health Care Practitioner's Guide to Dosage, Side Effects, Effectiveness, Toxicity and Interactions. A Review of the Research on the Most Common Clinical Artemisia Medications.

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*To those rare, precious physicians who are willing*
*to look beyond simple medical answers.*

*And to my beloved Joyce*

# Contents

# Artemisia's Amazing Ability for Killing Infections and Cancer

Artemisia is a revolutionary herb that is the source for many new medications such as artemisinin. The derivatives of this herb are so important that the World Health Organization and many other medical agencies recommend that approximately 400 million yearly malaria victims should receive this as part of their malaria treatment.[1,2]

**This means a Chinese herb is the first-line treatment for a massive medical illness.** This information is stunning and historic. Allopathic physicians do not prescribe herbs, and the FDA does not even allow physicians to prescribe herbs and make specific health claims for any of them.

Further, this medication is also effective against Babesia. This infection has at least ten types that can infect humans, and is found all over America. It causes both mild and deadly illness while almost no American physicians are able to diagnose it. Babesia is passed on by a tiny deer tick bite. The deer tick is often the size of a period, and when it passes on Babesia, it injects a painkiller, an antihistamine, and an anti-clotting agent.[3]

Therefore, deer ticks are virtually never noticed when they bite and pass on Babesia. Unfortunately, blood testing is often worthless at diagnosing it. In the chapters that follow, I will

introduce you to symptoms of Babesia and the new forms routinely missed. But the good news is that Babesia experts are very optimistic about the role of Artemisia medications and other medications in killing Babesia within the human body.

Finally, Artemisia and its derivatives appear to have cancer-killing properties. Specifically, many cancers absorb Artemisia medicines and then this herbal medicine creates powerful sparks or free radicals to kill cancer cells from the inside–like a firecracker inside a paper milk carton.

Artemisia medicines seem to kill some types of cancers more effectively than others. For example, the most beneficial effects of this herb seem to be against leukemia, colon cancer, and melanoma. It also appears to have the ability to kill breast cancer, ovarian cancer, prostate cancer, brain cancer, some kidney cancers and many other cancers.[4-6]

## Artemisia and Infections

The most important new treatment for malaria and Babesia is the exceptional herb called Artemisia. *Artemisia annua* is known in the United States as "Sweet Wormwood," "Sweet Annie" or "Annual Wormwood." It is often sold in the United States as artemisinin. It is native to many Asian countries, including China, where it is known as *Qinghao* or *Qinghaosu*.

Artemisia has been used medically for over 2,000 years, and it is mentioned in both the *Recipes For 52 Kinds Of Diseases* found in 168 B.C., and in the *Handbook of Prescriptions for Emergency Treatments*, written in 340 A.D. In 1596, artemisinin was named as a treatment for malaria by Li Shizhen. The major active ingredient was isolated in China in 1972.[7-9]

Currently various types of Artemisia annua seeds have been modified to grow all over the world. The herb may be found in Argentina, Bulgaria, France, Hungary, Romania, Italy, Spain, Africa, and the United States.[10]

## A Boy's Miraculous Artemisinin Experience

Artemisinin is a common derivative of Artemisia and is a respected treatment against red blood cell parasites such as malaria and American Babesia. Both live inside of red blood cells, and both appear to be killed by artemisinin. For little Xu Weifeng, artemisinin saved his life from malaria.

He nearly died from a raging fever when he was six years old. He lay upon a cot in a mountain hut surrounded by his parents, destined to become one more unknown victim of malaria.

"Every day the fevers began around four in the afternoon, and for the next ten hours I would not know if I was dreaming or dying," he recalled. Eventually a Chinese doctor gave him artemisinin and Xu quickly recovered. His artemisinin cure is now being hailed as a life-saver for millions.[11]

Artemisia products have been used to treat over a million malaria patients. They are currently considered by the World Health Organization to be top treatments for malaria when used in combination with traditional long-acting malaria medications.[12]

Artemisia is also a malaria treatment researched by the United States military, perhaps due to the malaria exposure of American soldiers in Vietnam. It is already being grown by the

United States Army in the state of Wisconsin, possibly for use by troops in Iraq and Afghanistan.

While it is grown throughout the world, one main growing region is a remote mountain range in central China, where farmers are now trying to satisfy the world's sudden demand. The Beijing Government is promoting mass cultivation of Artemisia, and the World Health Organization (WHO) plans to purchase about 100 million doses of the drug derived from this herb grown in China.

Mr. Xu, now 26 and fully recovered, is one of the local farmers converting entire valleys into shoulder-high Artemisia. As far as you can see, hillsides are covered with a sea of these lush green ferns. "In this region at least, there is no more malaria," Mr. Xu said.

The commercial development of Artemisia actually began when Vietnam asked China for help with their growing malaria problem in 1967. Beijing consulted an ancient medical text that included "qinghao," the Chinese word for artemisinin. A scholar named Ge Hong (281-340 AD) recommended "a handful of qinghao in two pints of water" for illnesses that appear to be malaria.[13]

At present, not enough sweet wormwood is available or affordable to poorer countries like Africa. Part of this sudden shortage is the open endorsement of Artemisia products to fight malaria

by major organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF).[14-16]

**The shortage has dramatically affected the cost of artemisinin, which has raised the price from $115 per pound to $455 per pound within a span of only 1-2 years.** Therefore, it has become unaffordable for full and effective dosing in economically disadvantaged countries. Because of this, the Gates foundation and medical companies are producing a bio-identical version of artemisinin that uses single-celled bacteria to make an active form of artemisinin, (artemisinic acid). According to *Nature*, the production of artemisinic acid is already being grown in special yeast.[17,18]

It is expected to take five years to accomplish this process and set up a manufacturing process large enough to lower prices significantly. By then it is also hoped that the FDA and other European regulatory bodies will approve the herb. Currently in the United States it is considered a food item, so medical insurance will not cover its cost.[19,20]

The properties that make artemisinin an effective anti-Babesia and antimalarial agent also appear responsible for its anti-cancer ability. Many cancer cells collect iron, and Babesia and malaria parasites cannot eliminate iron within red blood cells. When artemisinin comes into contact with iron, a chemical reaction ensues which spawns free radicals.

You might think of these free radicals as sparks or bullets flying out of a fireplace. They are highly reactive chemicals that are powerful enough to kill parasites thriving inside of red blood cells or iron-filled cancers. Artemisia makes this stored iron toxic to the parasite or cancer cell by creating free radicals that act like spark plugs throwing off destructive "sparks" of energy.[21]

In the following sections, we will examine the importance of Babesia as a serious emerging American infection, and the role that Artemisia can play in the treatment of this devastating, and undiagnosed or under-diagnosed illness.

## The Babesia Threat in America: Is Artemisia a Solution?

The world has approximately 850 species of ticks. **If you can find an infectious disease expert who can name a dozen tick species and the most common infections they carry, you have found a great rarity.**[22] **So our study of Babesia, ticks and treatment with Artemisia must begin with humility.**

The kinds of infections that these ticks carry are both highly diverse and numerous. A single tick may carry hundreds of infections. Once inside the human body, some of these infections have the ability to alter their physical form in over twenty ways in order to evade the human immune system.

In the last 30 years, medical science has only begun to learn about **one type** of tick-borne illness, Lyme disease. Lyme is on the increase. It appears that Babesia is also on the increase. But before we focus purely on Babesia, it is very important to briefly look at Lyme disease in America because it offers lessons about American Babesia.

While museums have hundred year-old ticks that contain Lyme, we are only beginning to understand the complex nature of this tick-borne infection. Indeed, it was a housewife and artist named Polly Murray who was responsible for discovering clinical American Lyme disease. She noted a flood of ill children

living within her hometown whose illnesses had been missed by many New England medical centers. Because of her work, physicians were willing to diagnose Lyme, but only as a joint infection. In reality, only 25% of Lyme patients with acute infection have arthritis.[23-26]

Simplistic views of Lyme lead to serious misdiagnosis by smart and sincere physicians. This is critical because Lyme bacteria migrate to the brain within days, and can also impact any human organ, and cause hundreds of possible symptoms. The addition of a Babesia infection to a Lyme infection increases both the number and severity of symptoms.

Before we examine Babesia more closely, you should note that despite decades of research on Lyme disease, there still remains no reliable and universally agreed upon lab test designed to clearly detect all of the 100 Lyme strains found in America.

In addition, **some Lyme lab tests use Lyme strains or species that are not even found in the geographical region of the patient who is being tested,** which obviously causes infected patients to have negative results. In the past, some labs were finding **"too many positive Lyme results,"** so they removed crucial Lyme proteins to dummy down the test and arrive at the "correct" frequency of positive results they desired.

The most commonly used Lyme test, called an ELISA test, con-

sists of grinding up whole Lyme bacteria so that **huge amounts of junk particles are present within the testing medium.**[27,28] These junk particles hide the very limited number of specific Lyme parts our immune system can recognize.[29,30] Therefore, some physicians feel the ELISA is not a "credible screening test," because the percentage of false results is as high as 75% in those tested.[31,32]

The question of inaccuracies in Lyme laboratory tests pales in comparison to test results for Babesia, which is also an infection carried by ticks. We call Babesia a "co-infection" which rides in tandem with Lyme, because as a trend in the United States, if you are infected with Babesia, you are probably carrying both of these infections.

Research scientists are just beginning to learn that substantially more Babesia exists than is currently recognized in the medical community. New species of Babesia are being discovered as I write, and those species are not weak, mildly symptomatic ones, causing something mild like a brief passing cold. We are finding new forms that cause severe illness and even death to humans living in the United States. Some of these new strains are being discovered by virtue of the intense symptoms and strength of illness they cause, much like a volcano is "discovered" because no one can ignore ten miles of explosive ash.

Further, we are finding aggressive new strains of Babesia in

some of our most heavily populated states, including states with leading medical facilities that still fail to find these infections. With Babesia charging forward, we are faced with the reality of a huge black hole in our knowledge of this disease.

More specifically, very little information exists in commonly researched reference sites like *PubMed*. For example, when we look under "Lyme disease and co-infections," the number of available articles is pitiful. **This deficit in detailed information about Babesia makes speaking with any medical certainty or authority about Babesia infections difficult.**[33]

## Is Human Babesia Rare?

Human Babesia is currently a rare diagnosis, so as a result, very little Artemisia is currently prescribed in America. For clinicians, researchers, professional expert witnesses and state board appointees, it is time to be humble, and realize we are **just beginning** our understanding of tick-borne diseases like Babesia, a discovery process that will very likely be decades in length.

One fact unknown to 99% of sincere American physicians is that Babesia is not as rare as they think. Babesia expert Dr. Gutierrez reports that **Babesia could prove to be a common infection, and not rare at all, as is currently thought in America.**[34] For example, Dr. Gutierrez quotes Leeflang's work in which 54% of 173 Nigerian men were proven to carry antibodies to Babesia.[35] Since physicians in Nigeria are routinely faced with another red blood cell parasite, malaria, it is amazing they would take note of Babesia at all.

Another study done in the 1970's shows that Mexico, just south of our border, had Babesia infections in approximately 36% of people who were tested. Among those tested, research indicated the subjects were not positive for the most common United States Babesia, which is the species *microti,* but instead to Babesia *canis,* a type of Babesia that more commonly infects dogs.[36]

We do not know how many patients in the United States currently harbor the illness Babesia. An assumption that the number of Babesia patients is merely a few dozen per state is dangerous and a sign of gross ignorance. State health department apathy about Babesia is apparent when we are already aware that **3-8% of blood donors have Babesia microti.** Indeed, in some western coastal states, antibodies against some type of Babesia-like organism might be present at a rate of 15% of the population.[37,38]

## Babesia Infection in Humans

Babesia can cause serious symptoms, or virtually no symptoms at all. Babesia can cause confusing symptoms, and unexplainable lab results and biopsies. When infected, some people immediately have a fever and fatigue, while other people do not become ill for years. Every person's experience is unique. However, some expert herbalists believe that Artemisia products can kill Babesia whether it exhibits mild or serious symptoms.

Some well-meaning physicians will tell their patients that they are cured of their "flu" or other medical problem, because their "objective" symptoms and signs are gone. I have met "cured" patients who came to me after visiting academic medical centers. This definition of "cure" is rather shortsighted. While it is true the patient may no longer feel feverish or dehydrated from some form of Babesia, many are not "cured."

Unfortunately for the patients, some clinicians will attempt to dismiss their patient's subtle residual symptoms as "subjective." This dangerously complacent definition means that the patient's symptoms are merely *something they are complaining about,* so they are ignored. This common attitude invalidates both the patient's knowledge of their own body, as well as ignoring their residual disease.

## Sample Babesia Signs and Symptoms

The most important way to diagnose Babesia is simply to ask if a patient or any pet has spent even a **few hours** walking in their suburban yard. Further, have these people done **any** gardening, camping, hiking, hunting, nature walking, or inland boating.

Below are examples of Babesia signs and symptoms in people as collected from over thirty human and animal studies, and patient interviews. Please note that some individuals with this infection have no symptoms. Be careful that you do not attribute symptoms to "aging." In this new world, a person in their forties is really in their early thirties, and someone in their sixties is closer to being in their forties. People routinely blame a new symptom such as fatigue or a migraine on their "old age." But some physicians and herbalists around the world believe that treating red cell infections such as Babesia can cure these symptoms.

Please circle any symptom that applies to you within the last ten years. Also, check those that apply to the sickest loved one you know:

High fevers
Dullness
Listlessness
Decreased appetite
Chills
Sweats

Headache
Fatigue
Muscle aches
Joint aches/pain
Depression
Anxiety/Panic
Nausea/Vomiting
Cough
Shortness of breath
Air hunger or unsatisfying deep breathing
Dark urine
Enlarged liver (under your right rib cage)
Enlarged spleen (under your left rib cage)
Yellow hue on eyes, hands and skin (jaundice)
Enlarged lymph nodes (also in Lyme or Bartonella)
Significant memory change
Profound psychiatric illnesses
Struggle to organize
Daytime sleep urgency despite nighttime sleep
Waves of generalized itching
Balance problems with dizziness
Severe chest wall pains
Random stabbing pains
Weight loss
Sensitivity to light
Sleep in excess of 8-1/2 hours per day
You have received blood from another person

When Babesia infects a person from very tiny deer ticks, they often infect the body with up to 100,000 Lyme spirochetes at the same time. Some clinicians feel that if you experience *sudden high fever, sweats and chills* within the first two weeks following a bite, or even periodically thereafter, that you should seriously consider Babesia as the culprit, and not assume the symptoms are from Lyme disease. We do not know how often Babesia is present with Lyme disease in patients.

Studies offer different ranges of Lyme patients who are also infected with Babesia. The range of people having both infections is approximately 12%-66%.

Part of the reason that we do not know how many people with Lyme have Babesia is because **we have no idea how many Americans have Lyme disease.** In one study, only 1 in 40 Lyme patients were reported to their regional health department, despite state-mandated reporting requirements for Lyme disease. Furthermore, these patients typically visited clinicians who were not fully educated on tick-borne illness, and who utilized labs with only a fair ability to detect Lyme disease. So the real frequency of Lyme patients is likely to be higher.

Dr. Virginia Sherr feels the number of state-reported Babesia cases is pathetically low. When she tries to report Babesia positive patients to the state health department, they dismiss her claims and have actually told her, "Ignore the diagnosis of

babesiosis because it is just **trendy**. It is not a medical problem in Pennsylvania."[39-41] She is flabbergasted at this casual attitude and has been quite pleased at how Artemisia derivatives have helped so many of her patients.

## Babesia—the Deadly Stealth Illness

We really do not know how many children and adults die each year from Babesia. I personally believe due to the highly rapid effects of Artemisia medications that this number can be reduced. Many researchers place the American Babesia fatality rate at approximately 5%. Yet much Babesia microti escapes detection and other forms of the parasite are missed. Newer forms such as Babesia *duncani* are dangerous and routinely misdiagnosed even while they cause severe illness.

According to Babesia expert Patricia Conrad, Professor of Veterinary Medicine at the University of California, some human cases of Babesia are being completely ignored. As a treating physician, I agree with her claims. When I ask infectious disease specialists, pathologists or internists about Babesia, they look at me with glossy eyes. Therefore, in terms of Babesia diagnoses, my patients are in trouble. **The medical establishment cannot diagnose or treat what it does not see or understand.** The danger with American Babesia is that patients with severe sickness go to a local emergency room with an illness no one is looking to diagnose.[42]

Our Babesia understanding is so poor that we are still discovering new species producing significant illness in humans, like Babesia *duncani*. This new strain does not harm humans in the manner in which a physician might expect, which would be by exploding red

blood cells. For example, Dr. Conrad explains Babesia duncani-infected hamsters die from **fluid filling their lungs.** Dr. Conrad believes humans infected with duncani may have similar symptoms.[43] Therefore, when adults and children go to an emergency room or their physicians for the following serious and common problems listed below, the cause might be a form of Babesia:

Shortness of breath
Unusual swelling
Fatigue
Poor appetite
Intermittent fever
Headache
Chills
Nausea/vomiting
Emotional liability
An unproductive cough
A sore throat
Light sensitivity
Belly pain
Weakness
Menopause or perimenopause
Poor long-term functioning[44]

Dr. Conrad and I are both concerned that these symptoms are sometimes caused by Babesia and are missed. We believe some Babesia infections are routinely diagnosed as basic asthma, a

psychiatric diagnosis, or sweating that might be labeled as perimenopause or flu. One way some Babesia escapes detection by your family doctor or emergency room physician is that **it does not cause anemia**–your red blood cell number is normal on their machine lab test, so you are sent home.[45] You are discharged because your breathing or temperature returns to normal, and the true cause of the illness is entirely missed–Babesia.

## What Happens When Doctors Miss Active Babesia?

You or your loved one can die or become dangerously ill from a wide range of serious Babesia symptoms such as:

Heart attacks
Heart failure
Severe fatal low blood pressure
Shock
Respiratory distress with poor oxygenation of the blood
Kidney failure
Diffuse full body bleeding[46]

To prevent these negative outcomes, physicians should learn that unexplained fever, shortness of breath or both, should raise suspicions of Babesia. When considering this infection, physicians need to order a urine hemoglobin level and a CBC or blood smear to be performed "manually."

What is a manual examination of blood? It involves a real laboratory expert searching under a very high-powered microscope (1000x) to find Babesia. The organism will appear as tiny infections inside the red blood cells. **This infection is very hard to see,** especially if the blood exam is rushed, or the wrong stains or the wrong techniques are used.[47]

## Babesia in Recent Human History

Of the 100 different species of Babesia, the first suspected human Babesial infection was in 1908, and the first clearly reported human case was in 1957, diagnosed in a Yugoslavian cattle farmer. The first American case was reported in Nantucket, Massachusetts in 1969.[48] I suspect that Babesia is very similar to Lyme. When new conditions existed that allowed for explosive growth (such as the complete removal of deer predators), Babesia became more common.

Babesia has increased largely due to the explosive deer population. Wild deer once hunted to near extinction, now overrun both suburbs and rural settings. Deer populations are so large that I actually have had a close friend who hit three deer with three different cars within an eight-week time period. The expansion of our human habitat with suburban lots peppered with scenic trees and brush has increased the contact of deer ticks and has resulted in an explosion of Babesia in the past several decades.

In the mid-1970's, physicians diagnosing Babesia in humans in America had to think of new medications outside the routine FDA-approved guidelines. In this same decade, Artemisia was getting renewed attention as a red blood cell parasite killer, but only in limited countries, such as China and Vietnam.

## Deer Ticks are on the Move

An infectious disease physician recently told a friend that Babesia could not be in Pennsylvania, Ohio or New York because as he put it, "deer ticks are largely limited to New England." This ignorant statement is frightening. Deer ticks are common and bite many individuals without their victim's awareness. For example, in a powerful study of San Francisco bay individuals, **researchers were able to detect antibodies against the saliva of deer ticks in 36% of human blood samples tested.** This means that deer ticks had bitten 36% of these San Francisco bay residents! This is the only way that these people would have antibodies against deer tick saliva.[49]

Deer tick habitats are expanding all over the North American continent. They are found as far southeast as the state of Florida (which has one million deer), to the northern Canadian provinces of Nova Scotia and Prince Edward Island, west to the Dakotas, and southwest to Mexico. A small sample of states have published brief studies reporting deer ticks carrying Babesia. They have been found in Pennsylvania, New Jersey, Delaware, and the entirety of New England, Minnesota, Wisconsin, Maryland, North Carolina and Georgia.[50-60]

Some physicians have told me they have diagnosed clear Babesia in almost every state in America, but they wish to keep this confidential, because a few ultra-conservative physicians

have made it their passion to deny Babesia and other tick infections, and have sided with insurance companies to apparently reduce treatment duration.

These Babesia denialists actually spend vast amounts of time attacking doctors who treat patients these deer infection denialists are unable to help. These tick infection denialists manipulate state board physicians, (many who were appointed partially as a political favor), into believing Babesia is rare.

In some areas of the United States, a huge number of animals have deer ticks carrying Babesia. For example, one sample area found that 80% of the mice that carried deer ticks were infected with Lyme, Babesia or Ehrlichia. 40% were infected with at least two of these infections. **In this context, the idea that Babesia is not a major health issue is simply flawed and dangerous.**[61-63]

## How Many Annual Cases of Babesia are Diagnosed in the United States?

It took 50 years to diagnose just one case of human Babesia in America,[64] and then another 50 years to discover many different and dangerous types of American Babesia that infect humans. Common sense says we have hardly mastered this illness. We are still in the beginning stages of finding new species and treatments.

For example, just today, thousands of people went to the emergency room with a high fever. Some were discharged with a fever of "unknown origin." An unknown percentage of these patients have Babesia. Any official-looking government or infection society publication that will tell you that your state has had 20, 200, or 2,000 cases of Babesia this year is playing at medicine. **We simply have no idea how many Americans have Babesia.**

## Introducing the New Forms of Babesia

A number of human Babesia forms currently exist which cannot be identified by most labs. Below, I list some samples of new Babesia types known to parasite research experts, but **unknown** to average clinical physicians including infection specialty physicians. Why would this fact matter to you? If you miraculously convince a physician to test you for Babesia, you will still not easily be diagnosed. Why? **No routine *human* laboratory in the United States can diagnose the various forms of human Babesia–period. And since physicians only acknowledge the results that labs present to them, your Babesia will be missed.**[65]

While we do not know how well each form of human Babesia responds to Artemisia, our list of infectious Babesia species is on the rise. For example, in the year 2000 a respected book was published which reported a mere four types of human Babesia (B):

**B. microti**
**B. divergens**
**B. bovis**
**B. equi**[66]

Some physicians are not even aware of these four species and think that only one form of Babesia is in the United States–Babesia *microti*. And while B. microti is probably the

most common form in the United States, pathologist Dr. Alan MacDonald was finding **non**-microti Babesia in New York during the 1980's. Those strains were proven to be live Babesia forms. Dr. McDonald inserted infected blood cells of this mystery Babesia forms into hamsters, and they developed the classic signs of Babesia red blood cell infection.[67]

Here we are in 2006, and we are still finding new forms. **Perhaps the only reason we are discovering new species is by their ability to cause significant illness which is occasionally deadly,** making them impossible to ignore. We do not know how many other Babesia species exist in the United States, especially species that are missed because they only cause modest illness.

Below is a list of the currently recognized forms of human Babesia found in America. In the first example, WA1-3 represents a form of Babesia first found in Washington State (WA) and the three patients who first had this unique form of Babesia numbered 1-3. Another form is called CA1-4, which means this was initially identified in California (CA) and four people (1-4) have been identified with this unique infection.

**Forms that can infect humans as of 2006:**

**WA1-3:** Three patients with this unique Washington state (WA) form.[68-73]

**CA1-4:** Four patients with unique California (CA) form.[74]

**CA5,6:** Two more California patients with a unique Babesia.[75]

**B. duncani:** A new species that includes both WA1-3, and CA5,6 and can be either mild or aggressive. This is a very serious discovery because this form does not appear to be rare.

For example, **four of the first patients found with this species of Babesia (WA1), had neighbors with high antibodies showing infection with WA1. How rare could this be if four folks on the same street are positive?** Further, WA-1 has increasingly been found in the western states, including California, the most populated state in the US. The symptoms of these patients range from no signs of illness, to a mild infection or "flu," to severe illness.[76-81]

**MO1:** Discovered in a Missouri patient, so it is identified as MO.[82]

**B. odocoilei:** A type of Babesia found in select deer but which can also infect humans.[83-87]

**EU1:** A form discovered in Europe and abbreviated EU. However, over time, Babesia forms which are supposed to be limited to the US or Europe are found on other continents, e.g., microti and divergens.[88,89]

**EU?:** A curious Babesia type related to B. odocoilei, a parasite of white-tailed deer, but unrelated to European B. divergens. This human-infecting Babesia has new unreported molecular characteristics.[90]

**B. canis:** A form of red cell parasite found in dogs which also infects humans.[91]

**B. bovis:** Another form of Babesia that can infect humans.[92,93]

**B. microti:** The most common form in the United States, which is often carried by mice.

**B. divergens:** A form commonly thought of as cattle Babesia, but it also infects humans and is very aggressive. It is the most common Babesia in Europe.

**B. equi:** A form common to horses but which can infect humans.[94]

**B. "unidentified":** Increasingly various forms of Babesia are described as "unidentified." This does raise a question about the clinical abilities of some pathologists and the education they are receiving about Babesia. It also raises the issue of how many forms of Babesia species are yet to be identified. Perhaps they are unidentified because they are unique new species.[95-97]

The reason I have listed the Babesia forms found in humans is so you and your physician understand that your lab is only attempting to test for Babesia microti. So you and your physician have to discuss the details of your symptoms, and how you feel, to make a diagnosis of Babesia, because most of the labs will be of no use.

Further, you will need to report any travel to your physician. For example, if you have been to California and have shortness of breath and strange fevers, it is possible you have Babesia duncani. That species is much more aggressive than Babesia microti, and might require more aggressive treatment. Your physician might decide to use a stronger form of Artemisia medication for aggressive types of Babesia species and add other medications to increase the effectiveness of the Artemisia product.

## Babesia and Malaria: Similarities in Treatment

Babesia and malaria are not identical parasites, but they do have much in common. One reason for the slow progress in Babesia research and treatment is due to the distinction between veterinary and medical parasitology. Babesia is more of an animal infection and malaria is more of a human infection. In any event, both organisms infect red blood cells. Babesia is similar to malaria in that both enter red blood cells using similar mechanisms.[98] Further, both are treated with the same types of medications.[99]

Malaria is one of the most serious worldwide health problems, with at least 300 million people becoming infected each year. Most medications and herbs now used for Babesia were first used for malaria, so if you read educational handouts on Babesia treatments, you might be surprised to notice malaria is mentioned, but not Babesia. Despite this, malarial medicines are utilized routinely for the treatment of Babesia. Similarly, while forms of Artemisia are aggressively used to kill malaria, they are increasingly used to treat Babesia.

## Babesia and Lyme: Why Treatments Fail

Some patients are not getting healthy because of residual Lyme and Babesia and other related reasons. Below are common reasons for treatment failure. Some American physicians with exposure to Chinese medicine believe some of these reasons for treatment failure could be reduced by the use of Artemisia products.

1) The antibiotic treatment is not aggressive enough, and the dose needs to be increased.

2) Treatment length was too short, causing a Babesia or Lyme relapse. Babesia or Lyme are not cured with one simple antibiotic, prescribed universally at the same dosages and identical treatment durations.

3) Babesia was treated only once. Much malaria research shows that malaria is a "smart" bug and that it learns how to evade a single treatment. This process may also apply to the Babesia organism.

4) The prescription medication is simply a poor fit to kill Babesia and a different one would be more effective. That is why some herbalists are appealing to American physicians that if Artemisia medicines can kill malaria in the brain in 3-7 days, it should be considered as an effective treatment for

its cousin, Babesia.

5) You have other co-infections along with Babesia. For example, perhaps you have a very aggressive form of Bartonella, another tick-borne infection, which is common and causes many medical and emotional symptoms such as anger, irritability, panic attacks, depression, rage and OCD.

6) You are exposed to one of the 30% of US buildings harboring indoor mold biotoxins. Any structure having unresolved leaks that are not repaired within two days or which has humidity routinely above 65% might have excessive mold behind walls, ceilings, baseboards or residing in the air ducts.

7) You are unable to remove Lyme or mold biotoxins from your body due to genetic limitations. Anyone with mold or Lyme must have their full five-part HLA evaluated to see if they are capable of removing these two types of biological toxins.

8) The treatment is too aggressive. The antibiotics alone or the antibiotics plus Babesia/Lyme die-off is too rapid, causing restlessness, painful joints, headaches, trouble thinking, fatigue and other ill feelings.

## Handling Relapse Issues with Malaria and Babesia

We know from malaria treatment that relapse rates drop if Artemisia medicines are used for longer periods and when another traditional malaria medication is added, e.g., *Lariam* (mefloquine). Artemisia products in combination with other synthetic malaria medications appear to be effective drug treatments in Asia.

Similarly, in Africa, a French pharmaceutical company is using artemisinin in combination with the drug *amodiaquine* to treat malaria with success. Other agencies and companies are successfully adding Artemisia forms to a wide variety of long-acting synthetic malaria medications.

Another option is to add other pharmaceutical herbs to the artemisinin herb. In China, herbs are commonly added to other herbs to help the "master herb" be more effective and to reduce resistance in which the herb loses its effectiveness.

For example, Dr. Zhang adds to his Artemisia, *allitridi*, the **stable** precursor to *Allicin* found in garlic. When taken in this manner, the Allicin lasts in the body for a longer period and is more effective, including easily passing through the brain's barrier to kill infections. While it has an odor, this is actually a sign of its effectiveness, Chlorophyll reduces this odor. Dr. Zhang also

uses *coptis* (umbellatine), and *HH* (dodecane carboaldehyde and 3-oxo), which are broad infection killers that like Allicin are small enough to penetrate into the brain. Allicin, coptis, HH and his R-5081 formula can be added to kill Lyme.[100] Others are looking at adding the herb *curcumin* to artemisinin, which shows some preliminary possible effectiveness against Babesia.[101]

## Forms of Artemisinin

Over twenty forms of natural and synthetic Artemisia exist. However, in an effort to keep this book functional, we are only discussing the most common forms.

Currently, there are a handful of common Artemisia products. They have very different properties, so lets discuss their basics to enable you to make smart decisions about this herb's options. Some forms of this herbal medication start with artemisinin.[102,103] Here is a brief look at the core practical facts of artemisinin.

### Artemisinin

Artemisinin was the first medicine derived from the Artemisia plant. Now it is one of the key active parent compounds used to make other synthetic forms. Artemisinin has a modest duration within the body. Approximately one-third is absorbed into the bloodstream when taken orally. Artemisinin easily crosses the intestinal wall into the blood, and this ability does not change with repeated dosing.[104,105] Its potency within the body is low. For example, by contrast, artesunate is 4 to 5 times more active in the body than artemisinin.[106]

Artemisinin is considered quite safe, and yet is able to cross the blood-brain barrier. Since artemisinin can enter the brain, it is effective for cerebral forms of malaria. In one study, malaria

fevers ended in 72 hours, and it also clearly removed malaria parasites. However, there was a relapse rate of 21% when treatment duration lasted only three days. Artemisinin is not a new herb with little research or clinical use. It has been extensively researched for malaria, and has been used on over a million patients, mostly in China and Vietnam.

One major concern with artemisinin is that it induces its own removal. Amazingly, **after only 5 days, the blood levels fall to one-fifth of the dose administered on day one.**[107] Most practitioners are unaware that therapeutic blood levels drop rapidly (due to auto-induction of liver enzymes). This ramping up of artemisinin removal enzymes begins just two hours after the very first dose.[108] However, despite this induction of the liver that removes artemisinin very rapidly, **the blood level of the active metabolite, dihydroartemisinin, increases with repeated treatment.**[109]

Artemisinin often cures malaria with a nominal dose of 250 mg per day. In one study, after a week of treatment, all patient blood was clear of malaria parasites and none had fevers. It appeared the malaria was largely killed within the first three days.[110] However, this study raises two issues, what is the "ideal dose" and what is a "cure." First, the dosing recommended by the World Health Organization for a 60-kg adult is 1200 mg on the first day, followed by 600 mg on the following day.[111]

Second, many studies claim 100% elimination of malaria within 3-7 days, but this is inaccurate. When any brief follow-up is conducted, (months or seasons after treatment), we find approximately 8-39% relapse with a return of the patient's malaria.[112-115]

## Dihydroartemisinin

The majority of the herbal medicine varieties derived from Artemisia end up as dihydroartemisinin, which is the herb's active metabolite. This means that most Artemisia derived medicines become dihydroartemisinin, which is the active ingredient that kills malaria and presumably Babesia.

Dihydroartemisinin was prescribed to men and women at a dose of 2 or 4 mg/kg for malaria, and it performed well. Both doses had minimal side effects and both were rapidly absorbed from the intestines. There was no significant difference between men and women in absorption or blood levels.[116] In 53 patients in another study, a total daily dose of 480 mg in adults every day for a week showed a malaria cure rate of 90%.[117]

## Artemether

This form is able to pass through fat in the body. It has the longest duration, but is also the most toxic form in high dosages–levels that are rarely necessary. This form is available overseas in both oral and injectable forms. Grapefruit juice

blocks the liver metabolism of this medication and allows it to last longer.[118]

The biggest advantage of artemether is that it can cross the blood-brain barrier. This synthetic form has been used in thousands of patients. If it is used for only 3-5 days, malaria relapses are common. Artemether is widely used for acute malaria. The oral form of artemether is poorly absorbed through the intestines as compared to artesunate.[119]

## Artesunate

This is a highly respected form of Artemisia that is the most active and the least toxic. It is also water-soluble. This form has a very short duration within the body and is 4 to 5 times more active in the body than artemisinin.[120] Artesunate is a synthetic form that has been used in thousands of patients. When taken for only 3-5 days, relapses are common.

This form is available overseas in both oral and injectable doses. In a comparison of oral artesunate and artemether, oral artesunate administration resulted in significantly higher blood activity time and better malarial killing. Further, oral blood levels of artemether were significantly lower than found with oral artesunate.[121]

Sample studies of artesunate have often used 50-250 mg tablets. Daily doses have ranged from 600 to 1200 mg per day with or

without a second synthetic anti-malaria agent, e.g., Lariam.[122]

One study of children with malaria given injectable artesunate showed it rapidly entered the bloodstream, with the maximum concentration of dihydroartemisinin (the main antimalarial metabolite), being achieved in under an hour in most children's blood. There were no major adverse events attributable to artesunate in the study. These results support using injectable artesunate in children with severe malaria.[123] The application of this study to the treatment of Babesia is currently unknown.

Very little is known about the peak concentration and duration of artesunate in the body. A dose of 150 mg of artesunate was fed **orally** to lab rats with the following results:[124]

- Blood levels of artesunate peaked within only 5 minutes.
- Blood levels of dihydroartemisinin peaked within 37 minutes.

In another study, when 120 mg of artesunate was administered to patients **intravenously**, the duration of the Artemisia derivatives were again found to be amazingly short.

- Half of the artesunate was gone from the body within 3.5 minutes.
- Half of the active metabolite, dihydroartemisinin, was gone within 34 minutes.[125-127]

Therefore, artesunate is very rapidly converted into dihydroartemisinin by stomach acid. The fact that artesunate reaches an early peak in the stomach within minutes of dosing is staggering.[128] Further, oral artesunate produces high levels of dihydroartemisinin, the potent functional metabolite, very quickly. However these levels do not last long, and so oral artesunate is recommended for repeated dosing throughout the day.

## Arteether

This medication is available in an injectable form and is metabolized slowly. It also has a longer duration in the body as compared to other artemisinin derivatives. Only 5% is converted to dihydroartemisinin. Arteether has an alpha and a beta part. The alpha part causes a rapid and significant blood level, and the beta part converts minimally and slowly to dihydroartemisinin and lasts longer in the body. [129,130]

## Dr. Zhang's "Artemisinin"

Dr. Zhang studied Chinese medicine for twenty years, and spent years mastering Chinese herbal medicine. He then received fellowships to study traditional Western medicine at Harvard and in Japan. He has the ability to make very complex Chinese herbal medicine understandable. In his new book, *Lyme Disease and Modern Chinese Medicine,* he discusses Babesia treatments. He reports success killing Babesia with a series of herbs

from Hepapro, a company that makes a form of Artemisia called *Artemisia anomala S. Moore.*[131]

Actually, Artemisia anomala S. Moore has no ability to kill malaria or Babesia and was an accidental mislabeling. I have been told the new bottles already have corrected labels with the name **Artemisia annae L** on the label. These capsules are actually **artesunate.**

Based upon decades of experience, Dr. Zhang has found that the synthetic and potent **artesunate is much more effective in killing malaria and Babesia.** His Artemisia capsules also have two other additional herbs to improve the effectiveness of the artesunate.[132]

His herbs can be ordered from www.hepapro.com.
Located at:

Hepapro
P.O. Box 7442
Laguna Niguel, CA 92607-7442
Phone 888-788-4372 or Fax 949-363-7715

## Compounded Artemisia: Suppositories

If you have a raw and painful stomach, one option is the use of Artemisia in a suppository. In one study, artesunic acid was prescribed as an intense treatment over one day's duration by inserting 200 mg suppositories every 6-8 hours into the rectum.[133]

## Artemisinin Transdermal Cream

Transdermal forms show good potential. Artemisia in the form of artemether, dihydroartemisinin, artelinic acid, and artemisinin has been used in transdermal gels with good results. Complete absorption of dihydroartemisinin through the skin appears to occur within 5 minutes following application.

In general, the transdermal malaria **preventive** dosing is about **half the curative dose for infected patients.** Peak blood levels appear to be achieved between 30 minutes to 4 hours after application. Since most American compounding pharmacists can put most medications into a wide range of forms such as transdermal creams or gels, this option might be possible in the future.[134-136]

## Artemisinin and Natural Vitamin A

The addition of vitamin A increases the effectiveness of artemisinin against malaria, and possibly against Babesia. The presence of vitamin A increases the killing power of artemisinin approximately 3 or 4 times. It is unknown what is the optimal dose of natural vitamin A. Pregnant women are told never to take over 4,000 International Units (IU) and men are told not to exceed more than 5,000 IU's a day. If you want a higher dose, then you should get a consult with a progressive nutritionist. Synthetic forms of vitamin A such as *Accutane*, can cause fetal

abnormalities if pregnant.[137,138] Further, the use of *cholestyramine* to bind Lyme or mold biotoxins will also bind fat-soluble vitamins like vitamin A, in addition to the other fat-soluble vitamins D, E and K and lower their levels.

## Artemisinin and Malaria, Babesia and Cancer: Mechanism Lessons

Artemisia herbals are being reported to be more than anti-parasitic agents. Some research shows they have anti-cancer ability. Artemisia's strong anti-red blood cell parasite properties offer lessons about its mechanisms for fighting cancer. Also, the ability of artemisinin to kill cancer depends upon the type of cancer.

**The highest beneficial effects of this herb seem to be against leukemia, colon cancer and melanoma.**[139-141] But artesunate also has important benefits against breast, ovarian, prostate, CNS, renal cancer cell and others.[142-144]

In some studies, use of Artemisia for cancer was shown to reduce or kill breast cancer, ovarian cancer, prostate cancer, brain cancer, kidney cancer and others.[145-149] In fact, the Artemisia derivatives artesunate (ART), arteether (ARE), and artemether (ARM) reveal remarkable anti-cancer activity.[150]

Some believe Artemisia effectiveness is based on iron use by cancer cells, though its effectiveness is not necessarily limited to iron mechanisms.[151,152] Nevertheless, iron is required for cell division, and most cancer cells aggressively accumulate iron for their rapid cell division. Because of this practice by cancer cells, artemisinin can react with the iron within these cancer cells to kill the cancer.

In one laboratory study, resistant breast cancer cells had a high propensity for accumulating iron. When these iron-loaded cells were treated with artemisinin, they had a 75% cancer cell die-off within only 8 hours, and nearly a 100% die-off within 24 hours. On the other hand, normal cells not heavy with iron, remained virtually unharmed by artemisinin.[153-158]

So Artemisia treatment appears to typically kill cancer by iron's involvement with its peroxide group, allowing the creation of reactive oxygen. **Artemisinin compounds without this peroxide oxygen ability have no clinical effects.** This means that tumors treated only with artemisinin in the complete absence of iron are not killed by artemisinin. Yet, merely treating cancer with iron alone does not reduce the tumor either. It is this combination of iron and artemisinin that is effective.[159-160]

Some research seems to show Artemisia medicines have multiple mechanisms of cancer killing, but the peroxide-oxygen spark theory that occurs inside the cancer cell seems to be the mechanism with the most research.[161,162]

## Keys to Artemisinin and Cancer Treatment

Increasingly, natural Artemisia is being converted into a vast number of different chemicals. Many of these have both significant and unique cancer-killing abilities. In one study for example, artemisinin was converted into two chemicals for anti-cancer effects. Both of these modified artemisinin chemicals selectively killed human cervical cancer cells without cell injury to normal cervical cells.[163]

Deoxyartemisitene, a derivative of artemisinin, is amazingly able to kill 14 different human cancer cell lines.[164] Other researchers believe that artemisinin or its derivatives have the ability to kill different cancers by attacking proteins unique to each cancer.[165]

### Breast Cancer and Artemisinin

Breast cancer has many forms. In a recent *Cancer Letter* publication, it was described how a chemically-induced breast cancer in rats had been prevented or slowed with treatment of artemisinin. The researchers gave the treated rats a mere 0.02% of powdered artemisinin in their food. After 40 weeks, 43% of artemisinin-fed rats avoided contracting cancer vs. 96% of the untreated rats that developed tumors. Clearly, artemisinin at a low dose resulted in fewer (and smaller) tumors. According to researchers, since artemisinin is a relatively safe compound with

no known side effects even at high oral doses, it is believed that artemisinin may be a potent cancer treatment.[166]

In another important study of human breast cancer, a compound that increases iron inside cells, (holotransferrin), was combined with dihydroartemisinin, the active metabolite of artemisinin. This treatment effectively killed a type of radiation-resistant human breast cancer cell. The same treatment had considerably less effect on normal human breast cells.[167]

## Cervical Cancer and Artemisia

Most cervical cancers are caused by human papillomavirus (HPV) infection. Since cervical cancer cells have large numbers of transferrin receptors to increase their iron uptake, anti-malarial drugs such as artemisinin, dihydroartemisinin (DHA) and artesunate display a strong ability to kill cervical cells transformed by the cancer-making HPV infection, and yet have little effect on normal cervical cells.

For example, DHA was first applied to the cervical areas of dogs and then the animals were exposed to the papillomavirus. DHA strongly inhibited viral-induced tumor formation. These findings indicated that DHA and other artemisinin derivatives might be useful for the topical treatment of epithelial papillomavirus lesions, including those that have progressed to a cancerous state.[168,169]

## Leukemia and Dihydroartemisinin

In one study, DHA was tested alone and with butyric acid, a nutrient for the intestine's colon, to study the effect on leukemia cells. In one day, DHA alone reduced leukemia cells by 40%. Healthy white blood cells were unharmed. Butyric acid reduced the number of leukemia cells 32% in a day, without significantly affecting normal human lymphocytes. The combination of DHA and butyrate killed 100% of these experimental leukemia cells in a single day, without harming normal lymphocytes.[170,171]

## Melanoma and Artemisinin

A patient who had metastatic melanoma and who failed standard chemotherapy was given artemisinin. The patient first experienced a stabilization of the cancer and then regressions of spleen and lung metastases. Amazingly, this patient is still alive four years after she was diagnosed with advanced cancer, which has a typical survival rate of only 2-5 months.[172]

## Glioma Brain Cancer Cells and Dihydroartemisinin

Glioma cells treated with dihydroartemisinin showed marked cell death. The more it was used, the more dihydroartemisinin reduced the number of cancer colonies. A reduction further occurred when using a combination of both artemisinin and radiation. In this study, free radical scavengers or antioxidants, significantly blocked the effects of dihydroartemisinin.[173]

## Other Cancer Forms and Artemisia

**Chronic Myeloid Leukemia**—When used along with traditional cancer treatments, it increases cancer cell death.[174]

**Liver Cancer**—Creative researchers have discovered that using artemisinin attached to a huge carbon molecule can kill certain types of liver cancer. Specifically, they took a huge synthetic large carbon molecule with 14 carbons and bound it to artemisinin. This compound was 200x more effective at killing liver cancer than artemisinin alone.[175,176]

**Prostate Cancer**—Highly modified artemisinin had potent anticancer activity against this form of cancer.[177]

In addition to the specific cancers mentioned above, other cancers might also be vulnerable to the cancer fighting abilities of Artemisia medications. These cancer types include but are not limited to:

**Kaposi's Sarcoma**[178]
**Astrocytoma Cancer**[179]
**Fibrosarcoma Tumors**[180,181]
**Oral Squamous Cell Carcinoma**[182]
**Ovarian Cancer**[183,184]
**Small-Cell Lung Cancer**[185,186]
**Stomach Cancer**[187]

In reviewing this material, it seems to me that artemisinin has the ability to help in the treatment of cancer. There is much we do not know in terms of the "ideal dose" for various cancers, the stages of each cancer, and even which cancers are the most vulnerable. I suspect that Artemisia derivatives will prove effective for those fighting cancer in future decades.

## Artemisinin and Low Body Iron

If we apply iron cancer information to killing malaria and Babesia, we gain even more information on Artemisia's mechanisms. First, many children and menstruating women have low iron levels. And sometimes these low iron levels do not show up in very basic labs. If you are found to have low iron or actual anemia, consider taking iron if taking Artemisia. If you only take iron for half of a week, we know from one study that Artemisia may not work as well with only **"fair"** supplementation.[188]

If your iron is low or your lab shows anemia, take aggressive dosing. If you are a women with periods lasting over six days per month, consult your physician to address possible estrogen dominance, which is a problem commonly missed. Low progesterone combined with higher estrogen levels causes poor blood vessel clamping, fibrocystic breasts and fibroids.[189]

Many iron products are available, but it appears that the one with the highest absorption rate, low side effects and which is

the most effective to use with Artemisia is *ferrous heme* (Fe+2).[190,191] This special iron combines with all common forms of Artemisia to create reactions that kill malaria, Babesia and some tumors.[192-194]

Therefore, if you are going to use Artemisia, make sure you have enough iron in your body by first running a full iron lab panel. In addition, one should check **ferritin**, which is a good body iron marker, and **hemoglobin** and **transferrin**. These labs allow you to make certain you have enough iron to combine with an Artemisia product and kill Babesia, malaria or some cancers. Your ferritin levels should be *above 45*. As a trend, when taking this powerful herbal medicine, it is perhaps best to be in the top half of normal blood iron levels.

Taking iron with vitamin C (such as Ester-C) will increase the absorption of the iron. Taking iron with orange juice appears to **double** iron absorption. Conversely, zinc, calcium and magnesium taken with iron will **decrease** its absorption. Tea decreases iron absorption by approximately 75%.

## Increasing Free Radical Sparks Increases Artemisinin Killing Ability

Medications like miconazole and doxorubicin work by increasing free radicals. In the same manner, we find that artesunate is even more effective at killing malaria and Babesia with free radicals promoted by iron. Malaria or Babesia in human red blood cells contain significant iron as part of their oxygen transport ability. Artemisia medicinal herbals kill parasites by using iron to generate free radicals. Artemisinin peroxides generate free radicals when exposed to iron. **Electron microscope images show malaria membranes treated with artemisinin are destroyed in ways typical of free radical killing.**[195]

### Lowering Free Radicals or Wild Bullets: The Basics

When artemisinin and ferrous iron combinations are exposed to free radical catchers like NAC, glutathione, catalase, vitamin C and vitamin E, less malaria is killed but other body tissues are protected.[196-198]

One of the ways people become slowly ill and eventually die is due to years of free radical damage. The same free radicals used to fight malaria, Babesia and some cancers, cause aging and organ damage over time. One might imagine these free radicals as being bullets in a fireplace. Human cells make energy in select areas of the cell that are like "fireplaces." But while the cell

is making energy, some bullets shoot out of the cell furnaces, which we call "free radicals." They can damage a wide range of cell parts, just as a wild bullet can. The good news is that we can catch these free radical bullets. The body has built-in enzymes and nutrients to catch these destructive free radicals. Some individuals believe that body injury is occurring when iron and artemisinin "work" by making free radical bullets that kill malaria, Babesia or cancer.

## Sample Anti-Oxidants and Babesia or Malaria

NAC is a natural chemical found in our liver. It is sold in virtually all health food stores and many pharmacies. It helps red blood cells **be less rigid from malaria or possibly Babesia so these red blood cells can move through the ultra-fine circulation.**[199] Malaria blocks the flow of red cells in tiny circulation tubes. Autopsies have proven this microcirculation obstruction exists in severe cases of malaria. Red blood cells become rigid and sticky and adhere to blood vessel linings, causing blockage.

During a Babesia infection treated with Artemisia products, free radicals are harming Babesia according to Chinese physician Dr. Zhang, but I worry some free radicals also harm the body, and the blood vessel lining can become damaged. This is one reason anti-oxidants are good to add to your treatment, because they catch excess Artemisia free radicals. Artemisia free radicals help the immune system explode the parasite but are *not selective.* We

want a balance between two opposite extremes. **We want to promote free radical parasite killing, but we do not want our blood vessels or other organs injured by free radicals.** Two options might be of use in this scenario.

1) In severe malaria and probably severe Babesia, rigidity of red blood cells may increase organ damage and death. Since these rigid red cells seem to be caused by free radical damage to the red blood cell membrane, the free radical "catchers" NAC, vitamin C and other anti-oxidants offer real promise in keeping blood cells both flexible and healthy.[200-202]

2) One interesting idea outside of Artemisia is the option to use a metal binder or chelator called *desferrioxamine*, which binds iron forms that produce free radicals. This drug has anti-parasite activity because iron is required for the reproduction of the parasite, and this medicine binds and removes iron.[203]

## Side Effects of Artemisinin

Most Artemisia studies report minimal side effects with these medicines. Well-documented clinical uses of Artemisia and its derivatives report the side effects listed below. However most patients have no trouble taking this medication.

- Skin tingling
- Reports of rare and transient heart block
- Possible heart palpitations
- Transient decreases in infection-fighting blood neutrophils
- Brief episodes of fever
- Possible liver or kidney effects based on an animal study
- Slight muscle aches after exertion due to low VEGF (vascular endothelial growth factor). VEGF makes and opens capillaries.
- Nausea or vomiting
- Abdominal pain
- Diarrhea
- Low blood pressure
- Cardiac and intestinal toxicity has occurred in animals (usually with higher doses)
- Fetal loss within the first trimester[204-207]

## Fatigue and Abnormal VEGF with Artemisia

In some of my other books, I discuss the studies of Dr. Shoemaker who has found that an abnormal VEGF (vascular

endothelial growth factor) can be caused by biotoxins from Lyme, mold, some lake algae and many other sources.

VEGF builds and opens capillaries and can be tested by a blood test with the best results from Quest labs, though not all Quest labs are up-to-date and able to offer it. Your local Quest lab can tell you if their processing lab does VEGF testing. If they do, it is usually covered by insurance.

Since Artemisia products lower VEGF, it is possible that these levels could become too low. In cancer treatment, physicians like VEGF low because it means that the tumor is not getting a full blood supply. However, if one is not fighting cancer, a low VEGF can cause aches, foggy thinking and fatigue either during or after exertion. One way to treat low VEGF is to use cholestyramine at 3-4 packets per day to bind the biotoxin (like from Lyme disease), carefully remediate and remove any indoor mold, and use 9-10 omega 3 enteric coated fish oil capsules per day. The enteric coating prevents the fish oil from annoying your stomach.

Some individuals have VEGF levels that are too high. According to Dr. Shoemaker, this is a sign of VEGF malfunction. Meaning, if biotoxins are blocking the VEGF receptors, the blood level of VEGF could be very high because its receptors are blocked. We have found that he is right—both abnormally low and abnormally high VEGF levels are a sign of illness and commonly caused by biotoxins from Lyme, indoor mold and other biotoxins.[208,209]

## Drug Interactions with Artemisinin

The liver has enzymes that help to remove medications and herbs from our systems. One important part of this process is the body's cytochrome P450 enzyme system. These enzymes do the lion's share of medication removal from the body. They easily remove some medications, while other medications inhibit these same enzymes, allowing any medication which is removed by them to rise in the blood. Other medications induce these enzymes to increase in number so that blood levels of any drug specific for them will fall.

Artemisinin **induces the liver enzyme 3A4**. Therefore, many of these enzymes are made and any medication which you take that is metabolized by this enzyme will have a reduced blood level. When you have more enzymes of a certain class, you have less of the drug removed by that enzyme.[210]

**Artemisinin also profoundly inhibits 1A2**, so drugs that require this enzyme to be removed, will increase in the body.[211]

**Finally, artemisinin creates many 2B6 enzymes.** These enzymes cause the unusual drop in the blood level of artemisinin very rapidly after only 5 days. These increased 2B6's drop artemisinin levels to one-fifth as high as on day one. I would expect that any of your other medications metabolized by 2B6 might also be reduced.[212,213]

Ideally, your physician or other healthcare provider should have a list of medications metabolized by each of these three enzymes to see how any of your medications might interact with Artemisia. In today's reality, few healthcare practitioners have time to compare each of your medications to the form of Artemisia you may have purchased during the rushed 5-10 minute appointment your insurance company approves.

Therefore, I would buy a drug interactions book or a drug handbook such as from *USP* (patient version) or *Lexi-Comp's* yearly medication handbook, so you can look up your own medications. This web site also offers large amounts of data on drug interactions: http://medicine.iupui.edu/flockhart/table.htm.

However, the main section of this web site might be too large for you. But at least look over the small table offering major drug interactions.

## Can Malaria or Babesia Become Resistant to Artemisia and Its Derivatives?

Most of the world's malaria researchers feel that **any** form of malaria treatment can lose effectiveness over time. They fear that using weak Artemisia doses could allow some malaria to survive and become resistant. This is one reason they want to pair Artemisia derivatives with synthetic, longer-acting medications. As of this year, it appears that malaria resistance to artemisinin products has not yet occurred. However, some notice that effective dosing might need to be higher in some areas where Artemisia has been used for some time. (This is a complex issue, and this higher dosing issue could be attributed to many factors).

Below are two studies that show that it is possible, over time, to have resistance to Artemisia medicines. Resistance is the loss of effectiveness over time. So researchers sped up the process of testing for resistance by using mice infected with malaria.

In both studies they treated infected mice with an Artemisia medicine and then injected infected blood with malaria into another batch of mice and then repeated this process. After some time it did appear that more medication was required to have the same malaria-killing effect. Curiously, resistance seemed to come and go in these initial tests.

In these special tests, once every 7-10 days, red blood cells with parasites were passed on to the next group of mice, who were receiving the same doses of artemether. They passed the infected red cells to 50 groups of mice, one after another for 50 passes. Resistance development was slow but increased considerably over the final ten passages. At the higher dose of artemether, effectiveness went from 4.8 increasing to 8.8 after 50 passages.

Importantly, resistance was unstable, since sensitivity reverted to near normal after five passages into healthy mice without Artemisia being used.

In conclusion, the pace of resistance in P. berghei (malaria) to repeated high doses of artemether is slow but can happen. In some study samples, the medication sensitivity can return to normal.[214,215]

## Do Artemisinin Formulations Hurt the Human Brain? Examining the Issues

The active ingredient of artemisinin, dihydroartemisinin (DHA) is from *Artemisia annua L.* (sweet wormwood) but **not** from *Artemisia absinthium* (wormwood). This matters because traditional wormwood is known to have neurotoxins like *absinthe, thujone* and *isothujone*. Some poor studies and even poorer articles discuss the side effects of Artemisia and confuse sweet wormwood with wormwood, but they are not the same herb at all.[216]

The more important issue is whether artemisinin, DHA, artemether, artesunate or other sweet wormwood products can hurt the body, e.g., parts of the brain or hearing structures. As a trend, the Artemisia types suspected of these side effects are forms used in high doses, for a prolonged period of time and are synthetic versions of the herb. While I think this herb can be used safely, I do **not** think a person should take the herb without reading the facts on this issue. Individuals who say Artemisia products have "no side effects," are in error.

The World Health Organization is promoting the use of Artemisia-based medications for malaria treatment. The WHO is familiar with the studies that report various serious side effects, but they are also are fully aware of the many malaria deaths each year. Therefore, this treatment is still being promot-

ed for millions of malaria patients. It appears they do not feel this side effect is common with their recommended dosing.

Perhaps the brain and hearing side effect worry began in 1994, when Breyer published results of his study using arteether at 20mg/kg/day in dogs for eight straight days. The dogs had significant neurological defects, and actual death occurred in five of six animals. Their neurological findings included walking problems, loss of pain sensation, and some brain function loss. In later follow up animal studies, Brewer noted many other findings, e.g., brain damage, EKG changes and seizure-like activity when using arteether or artemether.[217]

In a rat study using beta-arteether, (which is the longer acting arteether form), animals were given this herb in either long-acting sesame oil or a form rapidly removed. DHA is probably an active metabolite of arteether, so this was closely monitored.

The transport substance for the arteether mattered significantly in this study since **blood levels of arteether in sesame oil were 7.5-fold higher** in the final day of treatment. Brain tissue revealed some toxic changes in all animals. The extension of drug exposure time and constant detectable levels of arteether and dihydroartemisinin were more associated with severe neurotoxicity and less killing of malaria, while high levels and shorter exposure times resulted in greater malaria killing effects and milder toxicity.[218]

Scientists believe the side effects in this case are probably not due to low blood levels, but are more easily caused by intramuscular shots that have slow absorption into the bloodstream and can result in a continuous and **prolonged high level of drug exposure.**[219]

## Oral vs. Injected Forms of Artemisinin: Does Delivery Method Affect Toxicity?

In a comparison between injected artemether and injected arteether against common **oral** artemisinin forms, a number of important findings were noticed:

1) Brain toxicity occurred under **constant exposure** with either high dose injected, oil-based artemisinin derivatives or constant oral intake.

2) **Oral** artemether, artesunate, and DHA had similar neurotoxic effects, but with **no significant evidence of toxicity at doses below 200 mg/kg/day.**

3) The data also indicated that once or twice daily oral administration of artemether, artesunate and dihydroartemisinin is relatively safe when compared to intramuscular administration of the oil-based compounds. Oral doses spike and fall rapidly within hours of administration.[220]

## Animal and Human Toxicity Studies

Some researchers feel the effects of artemisinin products vary considerably between rats, mice, dogs and humans. They feel that the application of animal studies to humans is dubious when millions of humans apparently have used these products with only trivial side effects. Others feel that 38 published animal studies about artemisinin products clearly show a neurological risk in addition to some emerging cases of human neurological risk and hearing structure risk, mean it should not be taken without reflection.[221]

Researchers say that we have used animals for drug testing for decades, and finding toxic side effects in artemisinin products cannot be ignored. Others feel that large mammals do fine with artemisinin medications and this is more of an issue with small mammals and not their larger human counterparts. This distinction is also true with mainstream pharmaceuticals.[222]

Human studies are exhibiting a wide range of results. While malaria itself can cause various brain injuries, individuals with **no malaria** who take arteether and who are not ill or on other medications, have had hearing damage.[223]

A few studies exist showing patients who did not have pre-existing ear disease, who while on artemether or artesunate in combination with other top malaria medications, subsequently

developed ear disease.[224-227]

Other studies point to the use of artemisinin in millions of patients and the exceptionally rare findings of neurological damage with artesunate use.[228,229] Further, in individuals who died of severe malaria and who were treated with quinine and artemether, no unique neurological damage was found.[230]

One final piece of evidence is the effect of artemisinin products on brain tissue cultures. When living tissue in culture is exposed to Artemisia products, it appears that artemisinin and its products kill both neuronal and brain support cells (glial cells). Some cell tests show that significant cell toxicity is seen at dosages as low as 1-2 mg/kg of human body weight.[231-235]

In the *Toxicology Letter,* their conclusion on the issue of artemisinin brain toxicity was:

1) The prolonged presence of Artemisia products in the body due to the **slow release** of oil-based intramuscular injected formulations is the main cause of the observed toxicity in laboratory animals.

2) In contrast, oral intake of these compounds, which is by far the most common formulation used for treatment of malaria patients, results in rapid clearance of these drugs and is thus unlikely to cause any toxicity in human subjects.

3) The relatively high doses of artemisinin compounds used in animal studies cause toxic reactions in animals due to different effects in animals as opposed to humans.

4) Animals respond to different delivery routes in a way that promotes toxicity as compared to humans.[236,237]

## Pregnancy Toxicity and Artemisia Derivatives

Moderate artesunate exposure to pregnant rabbits and rats had serious negative fetal effects including dramatic early embryo loss, rare heart and blood vessel abnormalities and many types of bone defects. These problems happened even in healthy animal mothers. In order to radically reduce these risks, the artesunate cannot be greater than 5 mg/kg/day.

Further, a human study of 700 pregnant women had markedly better results. No developmental effects were found in 100 first trimester mothers and 600 second and third trimester mothers treated with Artemisia derivatives, primarily artesunate. It is possible that rats and rabbits are more sensitive to Artemisia than humans.[238]

## Conclusions to Toxicity Data

1) Millions of people have been exposed to artemisinin and other synthetic forms. Many have taken only 1-10 days of this herb. Nevertheless, if this group of herbal drugs easily damaged human brain stems or hearing systems, it would probably be obvious even with routine dosing and short durational use.

2) Animal cell cultures show that these herbal drugs can damage brainstem cells.

3) Massively high doses of any artemisinin drug causes mammal neurological damage.

4) Oil-based synthetically derived forms create a longer half-life, which results in **constant** and unremitting free radical effects on the brain.

5) Oral dosing allows for very fast and very high blood levels followed by **the complete removal of the drug within hours,** thus allowing the brain a rest from free radicals.

6) High dosing which is continuous, e.g., IV or injected, that lasts three days or longer might be problematic.

7) I am unaware of studies that address the issue of liver enzyme induction in any form of Artemisia except artemisinin. This latter form falls quickly to low blood levels, while the active metabolite dihydroartemisinin increases.

8) The weight of the patient probably matters. Many studies are based on doses per kilogram. Since medication dosing is typically safest with an awareness of body weight, I do not believe this variable should be ignored.

9) In a study of artemether's toxicity, 68 patients were treated with artemether (and a malaria medicine lumefantrine) within the previous five years were matched with a control group of 68 people of the same age and gender. Both groups had the same functioning, with no auditory or brainstem toxicity found in the study group.[239]

10) Individuals with a genetic HLA pattern of 15-6-51 or 16-5-51 or other such patterns are individuals who do not remove Lyme's surface endotoxins or biotoxins naturally, and so they develop severe and extensive chemical reactions all over their body. (See Shoemaker, Schaller and Schmidt. *Mold Warriors* for LabCorp HLA DR DQ test order codes with a significant explanation).

Treating any tick-borne infection such as Babesia without the awareness of the genetic patterning issue often leads to:

- Diverse and severe hormone abnormalities, e.g., marked alterations in MSH, VEGF, Free Testosterone, DHEA, Free T3 Thyroid and VIP
- Wide-ranging creation of abnormal inflammation chemicals
- Many types of autoimmunity

## Dosing Recommendations: Oral Intermittent Dosing

While it is very clear that artemisinin and its related medications are exceptional medications to treat malaria, the correct dosing for Babesia or various cancers is unknown. Various communities, countries, clinicians and studies are using such a wide range of dosing that **authoritarian dosing suggestions are not possible.**

While we appreciate that many Chinese herbal experts are more aggressive than the suggestions below, we are simply trying to be careful. **Dosing artemisinin or its derivatives remains in a state of evolution. Yet this medicine has already been used in over 2 million patients with limited side effects. Therefore, this is *not* an experimental herb.**

In high-quality studies it was found that synthetic artemether, when **orally** administered at a dose of 6 mg/kg **once** every 2-3 weeks, resulted in no drug-related adverse effects.[240]

In collaborative research between Chinese, European and African scientists, artemether showed no indication of neurotoxicity following repeated high doses of artemether when given **every 2 weeks** for up to 5 months. Note the long time span between doses.[241]

Artesunate taken at 4 mg/kg in one dose followed by a dose of Lariam appears to be safe. Yet this single dose combo leaves one-quarter to one-third of malaria alive. Therefore, single doses with Artemisia derivatives is probably a poor treatment option for both malaria and Babesia.[242]

Artesunate at 4 mg/kg/day combined with Lariam at 8 mg/kg/day administered orally once daily for **3 days,** and dihydroartemisinin 40 mg with piperaquine at 320 mg once daily for **3 days** were both successful at removing malaria, with no toxicity reported.[243]

Artemether given to dogs at a high daily dose of 135 mg/kg for 2 weeks did not cause severe side effects. This very high dose produced no hearing tissue damage or brain damage tissue signs when examined microscopically. Some dogs exhibited an increase in liver weight, and liver cell enlargement, and showed some changes within kidney cells.[244]

Nevertheless, high doses of injected Artemisia medicines can harm the brain stem in laboratory animals. This can happen to the brain of a dog in only three days following three oil-based injections or IV treatments with dihydroartemisinin, artemether and arteether **in doses exceeding about 6mg/kg/d intramuscular or intravenous for 3-5 days in a row with no break. The same damage occurs with a massive single injection of over 100 mg/kg.** Monkeys seem to require doses even higher for the

same type of damage to occur. Rats appear to also require large dosing for brain damage to appear.

Some researchers believe that there is little reason to anticipate brain stem or hearing damage in humans if one is using artemether at 3-6mg/kg/day in a muscle-injected form or artesunate in rectal suppositories for three days.[245]

Dihydroartemisinin or artemether significantly inhibited neurons in small lab samples. This effect was prevented by exposure to the anti-oxidants superoxide dismutase, catalase, glutathione, L-cysteine, NAC (N-acetyl-L-cysteine) and ascorbic acid or Ester C (vitamin C). Glutathione prevents the neurotoxicity of artemether and dihydroartemisinin. Artemether depletes intracellular glutathione levels, whereas dihydroartemisinin had no effect. All of these anti-oxidants are available from my web site, at their published wholesale prices at: www. personalconsult.com.

Further, I have found many patients enjoy fruit-flavored sublingual glutathione. Sublingual pills or troche forms go right into the blood–these are similar to nitroglycerine tablets, but these sublingual pills deliver glutathione into the bloodstream instead of nitroglycerine.

These glutathione prescription lozenges can be purchased in blueberry or tangerine flavors at Lionville Natural Pharmacy at

877-363-7474 or a prescription can be faxed to 610-363-5707. College Pharmacy in Colorado also has a pleasant-tasting tangerine glutathione sublingual tablet.[246,247] The main number at College Pharmacy is 800-888-9358. Their fax number is 800-556-5893.

Many patients are very well read and insist on using Artemisia treatments. Some have decided to take it in the following manner:

1) Health practitioners from all around the world are recommending 200 mg–2,000 mg a day of artemisinin depending upon whether it is used for cancer, malaria or chronic Babesia. High doses are divided to keep the blood level intermittently high. Also, it is important to recall that artemisinin induces its own metabolism. **After only 5 days the blood levels fall to one-fifth of the dose found on day one.**[248] This artemisinin enzyme induction begins just two hours after the very first dose.[249] However, despite this induction in the liver causing artemisinin to be removed very quickly, **the active metabolite, dihydroartemisinin, rises with repeated treatment.**[250]

   So in summary, the potent and active metabolite of artemisinin is dihydroartemisinin, and regardless of what happens to artemisinin levels, the potent metabolite climbs. Because of this, I lean toward giving medication breaks so

that the dihydroartemisinin level is not constantly high.

2) Some of our patients decide to take oral artemisinin at **25 mg per kilogram per day** divided into two or three doses and **taken two days in a row with one day off,** then restarted. In other words, it is taken for two days, skipped for a day, and then taken for another two days. They may use this dose for months or seasons. This dose is usually between 1250-2500 mg per day depending on their body weight. They also make sure their iron levels are in the top 50% of normal. **Some allopathic physicians are "prescribing" 1800 mg per day of artemisinin.**

3) A malaria web site reports "400 to 800 mg per day can gener-ally be used for at least 6 to 12 months. After that, it can be tapered off slowly." They also report that some believe artemisinin should be taken with food such as cottage cheese or fish oil to enhance absorption.[251]

Since Artemisia products make parasite-killing oxidants or "sparks," it is possible you should not take your antioxidants, such as vitamin C, within 2-1/2 hours of taking an Artemisia product or you might undermine its effect on Babesia. However, how to balance taking free radical making Artemisia products together with protective antioxidants in **the real world of clinical medicine** needs additional research.[252]

4) Oral artesunate is available from HEPAPRO.COM in 400 mg capsules. **The Chinese herbalist, Dr. Zhang, suggests taking 400 mg three times per day and sincerely reports no serious side effects.**[253]

Unfortunately, most of the relevant English research studies generally use 500-800 mg per day. Therefore, I personally do not feel that artesunate's safety has been proven at 1200 mg per day taken daily for months. I certainly could be wrong, but personally, if I were using this product, I would probably start by using 400 mg three times a day every other day for two weeks. If I did not have complete improvement of my severe fatigue, chills, fevers or sweats, then after fourteen days **I would increase it to two days in a row with a break every third day for up to 6 months.**

A few researchers have made the important point that the injury to the hearing centers and brainstem might be so subtle that only sophisticated lab testing would discover it, so I am just trying to be careful.

**Oral artesunate doses should be limited to 400 mg at a time, and should not be doubled up in the same day if you forget a dose.** Why? We do not have enough studies on dosing variations in humans to know the ideal or the safest single dose. Further, my concern is based on noting that some research seems to show the higher the dose, the higher the

risk. It might be that patients taking anti-oxidants or who have a good immune system have little or no risk of side effects. But physicians need to assume the worst.

Therefore, perhaps patients should be offered the option of an audiology exam before starting an Artemisia product, and then offered a repeat audiology exam after two months of treatment. If a patient is too tired to get this testing done twice, then you might consider getting an audiology exam after taking any Artemisia product for 4-8 weeks to see if you are developing subtle injury. While this is not the standard of care, I am just trying to be extra careful.

5) World Health Organization (WHO) dosing recommendations are based on the treatment of malaria, not Babesia. But since the two are both parasites that live inside red blood cells, it is useful to read their suggestions.

They believe that it is best to combine any form of Artemisia with a traditional synthetic medication to prevent relapses and to reduce the chance of Artemisia medication resistance in which the Artemisia drug loses its effectiveness over time.[254,255]

- The WHO organization dosing suggestions include: artemisinin at 20 mg per kilogram on the first day, and then 10 mg once a day for 2 days. This would be taken with an added synthetic medicine like Lariam. (Another synthetic

medicine, *lumefrantrine*, is going to be aggressively used by the WHO with artemisinin derivatives. This medication is currently not available in the United States).[256,257]

**Just as a reminder, the conversion to pounds is:**

Kg x 2.2 = pounds.

So a person who weighs 68 kilograms weighs 150 pounds. (150 pounds divided by 2.2 = 68 kilograms).

- Another WHO dosing option is artesunate or artemether dosed at 4 mg per kilogram once a day for three days. Lariam or another synthetic medication with long-lasting effects would need to be added.

If for some reason the second synthetic drug was not going to be added, then the Artemisia product would be used for seven days and not just three days. If artemisinin is used, the WHO suggests 20 mg/kg on day one and 10 mg/kg for six days. Artesunate or artemether would be given at 4 mg/kg on day one, and 2 mg/kg for six days.[258,259]

In future editions, I will most likely revise these dosing guidelines as new information appears. New information should include the best dosing to treat Babesia, and not simply plugging in malaria dosing and assuming it is optimal treatment for

Babesia. Cancer research is currently examining artemisinin products for many types of cancer. Probably, different tumors will require special dosing, frequency, duration and a specific derivative.

**In conclusion:** I am not offering a cookbook ideal dose for each person for all of Artemisia's medical uses. So I am referring you to your healthcare provider to determine your ideal dosing plan.

**We do not know with certainty how many times a day to safely take Artemisia products.** One study reports that since the blood duration of the active artemisinin ingredient of dihydroartemisinin is fairly short, oral dosing should be at least twice a day to maintain an effective intermittent blood level.[260]

If possible, I think three doses causing three blood level peaks might be even better. These three high doses pulsed throughout the day seem to clearly kill malaria and probably Babesia as it enters a vulnerable phase.

## Artemisia Sources

The actual dose in a capsule depends on many factors. In Africa and parts of Asia, many capsules have little or none of the active ingredient, but some products exist with good potency and quality. For example, Allergy Research Group tests the potency of every batch they sell.

There currently exists a wide range of types of seeds and locations to grow Artemisia. Artemisia's potency varies from one manufacturer to another based on height, sun exposure, soil, seed variety and time of harvest. Based on these factors, the potency of each batch of artemisinin should be determined by a third party. The purity should also be determined to make sure metals and pesticides are not present.

## Artemisia and Its Derivatives Informed Consent

1) I understand that the FDA approves no Artemisia form. The FDA has not approved any herbal medicines for the treatment or cure of any disease or illness.

2) I understand that I have other options for treatment and I insist on this option.

3) I understand it is suggested that I seek other medical opinions to determine if I have Babesia or malaria. I must have at least one other evaluation if it is possible I have malaria, Babesia or cancer. I can always freely seek other opinions about the use of Artemisia derivatives.

4) I understand that in the USA, Babesia is believed to generally be a very rare illness by most physicians and health departments, and therefore it is not routinely tested for in individuals with Lyme or deer tick bites.

5) I understand that no one is able to routinely diagnose all the possible forms of Babesia in the USA. So it is possible I could be treated for an infection I do not have, i.e., Babesia.

6) I understand some studies suggest Artemisia derivatives

may harm hearing and/or hurt the brain.

7) I agree never to increase or double my dose.

8) I understand I have the option of NOT using Artemisia-related treatment to treat possible Babesia.

9) I understand I can stop this herbal medicine at any time.

10) I understand that most infection experts, internists and family doctors do not believe Babesia is common in any location in the United States, and would typically oppose both the diagnosis of Babesia and any treatment with Artemisia products. No cancer centers in the United States routinely prescribe Artemisia products for any form of cancer.

11) The possible interactions with this herb are unclear. I feel that injury or illness resulting from this herb or its interactions should not be blamed on my physician. I understand that the liver has various enzymes to remove drugs. I understand that artemisinin increases or induces 3A4 enzymes, profoundly inhibits 1A2, and creates many 2B6 enzymes. I can read about these groups of medications at: http://medicine.iupui.edu/flock-hart/table.htm. Yet I understand data on interactions with Artemisia and its derivatives is very preliminary.

12) I understand my physician will not terminate me just because I refuse to take this herbal medication.

13) I agree not to bring any malpractice suits against any healthcare provider suggesting this treatment to me, nor to defame the good name of this healthcare provider who is trying to help me. I will not defame him or her to friends, relatives or government officers or agencies.

14) I take full responsibility for this treatment and no one is forcing me to take this herbal medicine or any of my other treatments.

15) My healthcare practitioner does NOT claim to be an expert in the use of Artemisia or its derivatives.

16) My healthcare provider does not claim to be an expert in the diagnosis or treatment of Babesia or malaria.

17) I understand Artemisia is NOT the standard of care or promoted by ANY cancer society in the United States.

18) My healthcare provider cannot guarantee the purity, potency or safety of any herb or medication. This is the responsibility of third party suppliers, and not my healthcare provider(s).

Patient Name Printed: _____

Patient Name Signed: _____

Patient Date of Birth: _____

Date of Signature: _____

**IF I DO NOT HAVE TIME TO FULLY REFLECT ON THIS CONSENT, I WILL READ IT FULLY BEFORE I PURCHASE OR TAKE ANY HERBAL PRODUCT OR MEDICATION OF ANY KIND.**

## Informed Consent Disclaimer

The medical ideas, health thoughts, health comments, products and any claims made about specific illnesses, diseases, and causes of health problems in this book, have not been evaluated by the FDA, the USDA, OSHA, CDC, NIH, NIMH, IDSA or the AMA. Never assume any United States medical body or society, or the majority of American physicians endorse any comment in this book. No comment in this book is approved by any government agency, medical body or medical society. Nothing in this book is to be used to diagnose, treat, cure or prevent disease. The information provided in this book is for educational purposes only and is not intended as a substitute for the advice from your physician or other healthcare professional. This book is not intended to replace or adjust any information contained on or in any product label or packaging.

You should not use the information in this book for diagnosis or treatment of any health problem, or for prescription of any medication or other treatment. You should consult with a healthcare professional before deciding on any diagnosis, or initiating any treatment plan of any kind. Dr. Schaller does not claim to be an expert in any illness, disease or treatment. In this book, he is merely sharing one of his interests. Please do not start any diet, exercise or supplementation program, or take any type of nutrient, herb, or medication without clear consultation with your licensed healthcare provider.

# Notes

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# END NOTES

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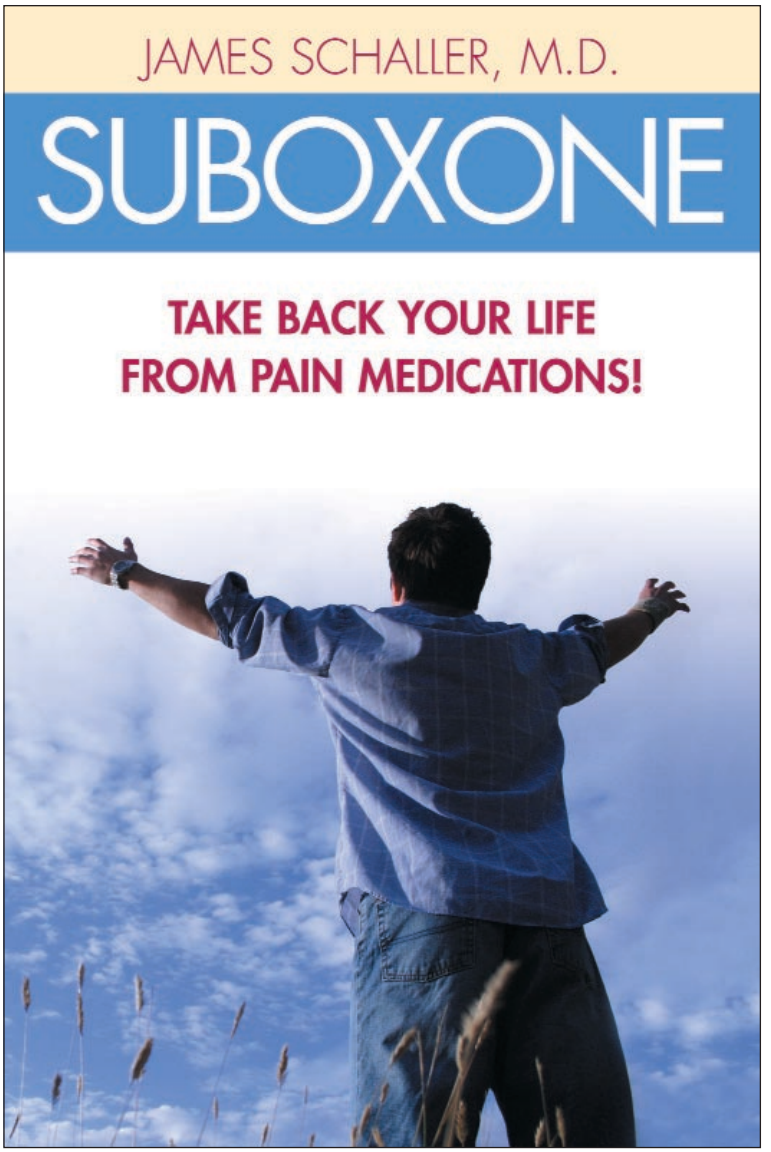


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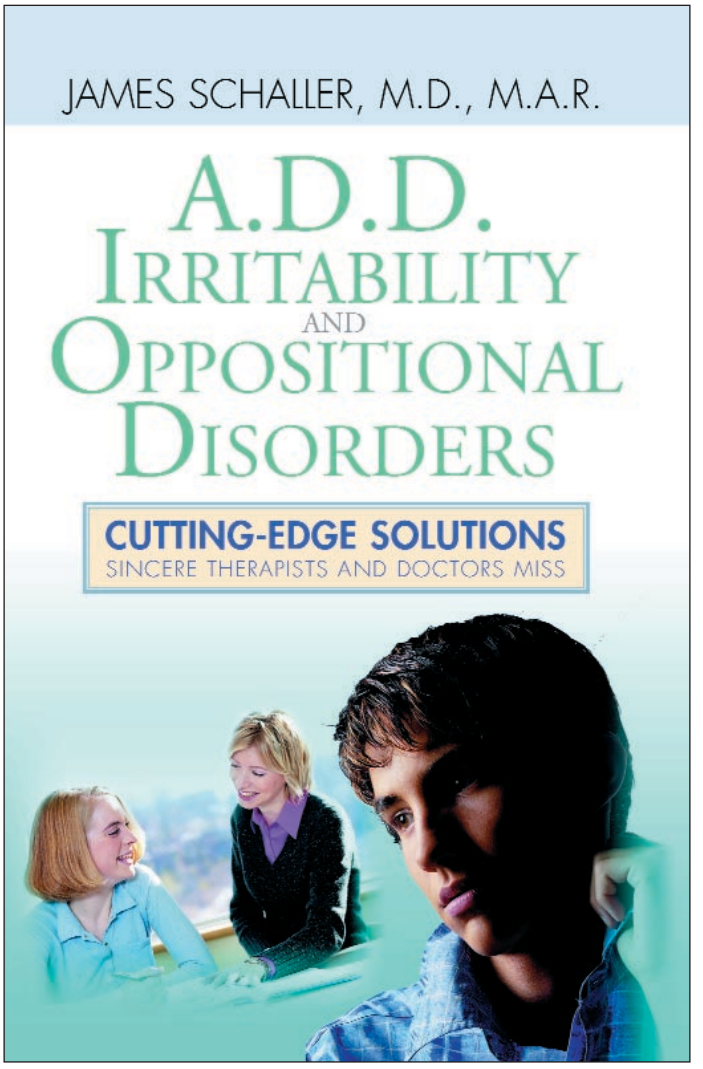


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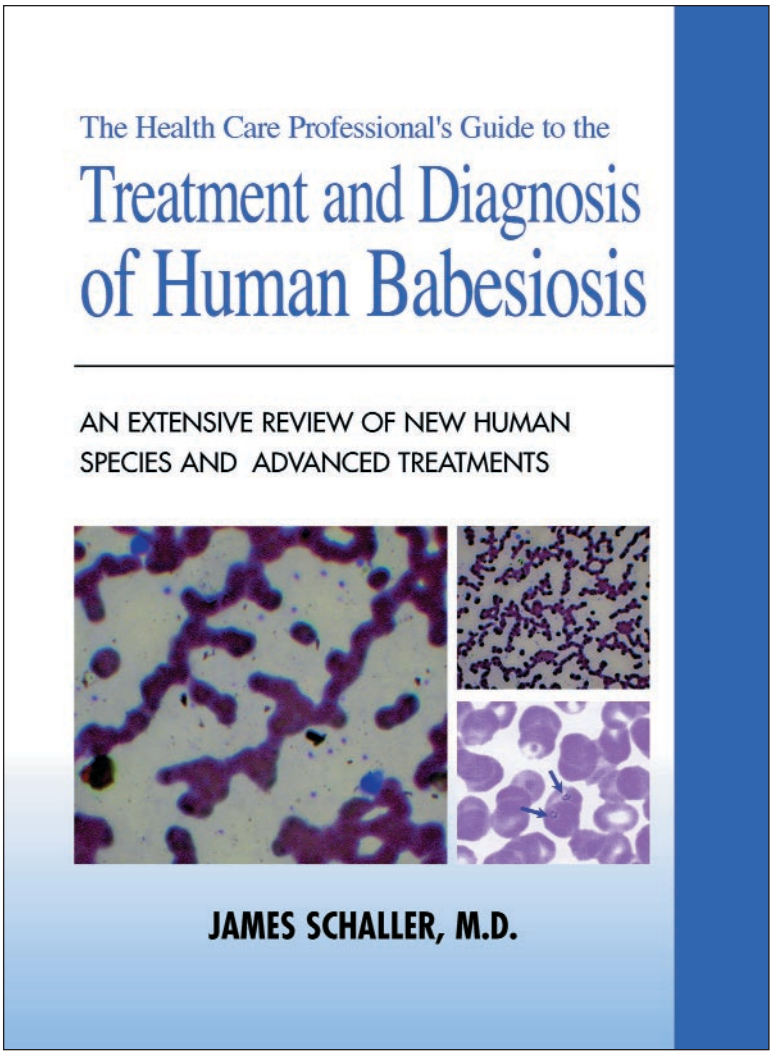


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