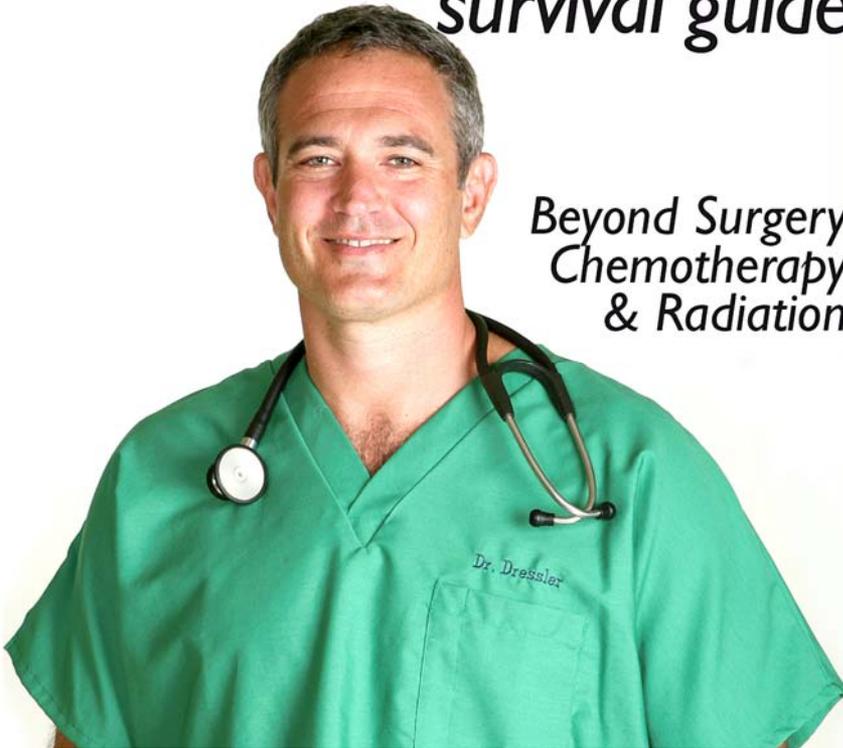


Dr. Demian Dressler, DVM

*the* **DOG**  
**CANCER**  
*survival guide*

*Beyond Surgery  
Chemotherapy  
& Radiation*



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## Introduction: Max Wakes Me Up

Glenda was waiting for me in my exam room. Her dog, a 9 year old Golden Retriever named Max, was wagging his tail in spite of his limp. The stitches were still in his front leg from the bone biopsy ten days earlier. Glenda looked at me with anxious eyes.

“Hi Glenda. And how ya doing, Max?” I scratched him on the rump.

I asked Glenda, “How has he been doing since his biopsy?”

“Well, he has been taking his pills in hot dogs, but look at him. He’s still limping around, just like he has been for the last 2 weeks. I thought those big brown pills were going to help a little more than they did.”

She was talking about the anti-inflammatory I had given her for Max’s orthopedic (bone) pain. “Sorry Glenda, I was hoping they were going to help a little more too.”

I paused, and she looked over at me, her hands clasped tight in her lap.

“Did you get the report?” she asked, searching my face for a hint of what was to come. I took a deliberate breath in.

“Yes, the biopsy report came in this morning.” I felt myself tighten up. As much as I didn’t want to, I had to give her the news. “The area of bone I showed you on the X-ray is not looking good. It’s a cancer. The name of the cancer is osteosarcoma.”

Glenda stared at me. She squinted in disbelief, and at the same time I could see the tears shining on the rim of her eyelids.

“What?” she softly asked.

“Osteosarcoma. Max has bone cancer.” I still didn’t want to say it.

“So you are saying my dog is going to die of cancer?”

“Well, we have different options. It’s a little early to say how things will turn out,” I answered, dodging the question. The real answer to Glenda’s question was complex, and I wasn’t sure she was ready to start talking about survival statistics.

“I thought you said this was an infection. You said it looked like an infection on the X-ray.” Her eyes flashed. “Sorry, I’m having a hard time believing what you’re telling me.”

“Well, infection was one of the possibilities we had discussed. The other main possibility was a cancer. They can look very similar on an X-ray, which is why we did the biopsy. I’m really sorry. I wish the test results had come back differently.”

The anger faded from her eyes, replaced by grief. Tears started spilling onto her cheeks. She cupped her face in her hands. Max came over and stood quietly by her side. He leaned his head against her thigh.

I offered her some tissues and put my hand on her shoulder. I knew the tissues didn’t change anything, but I didn’t know what else to do.

I gave her a minute to compose herself. She wiped her smeared eyeliner and looked up, sniffing. She balled up the moist tissues.

““What are the options?” she said in a very small voice.

Here we go, I said to myself. This part of the conversation was going to be tough as well.

“The treatment options are surgery, chemotherapy, and radiation,” I started. I quickly went through the available treatments. “Surgery would mean amputation. Yes, dogs can walk on three legs, but no, it likely will not cure the cancer in the end. Cancer has usually already spread through the body by the time it is diagnosed. Median survival is about 4-5 months. Chemotherapy puts it at about 10 months, give or take. Radiation can take away the pain for about 1-2 months per treatment.” As I gave her the numbers, I saw her face fall deeper into darkness.

When I was done, she said in a whisper, “Is that all? That’s it?”

“Yes,” I confirmed. “Those are the options we have.” It had taken me about ninety seconds to go over everything available, at least what was available to a vet with over a decade of experience in conventional veterinary cancer care.

“But, I mean”— she stammered. “How did Max get this?”

I began my standard cancer lecture. “No one really knows exactly how cancer starts. It’s a multifactorial disease, which means many things can increase the odds of it happening.”

“Is it his food?”

“Well, not really.”

“I have heard that vaccines can do it. What about toxins or something? Should he be wearing sunscreen?”

There was no one answer to Glenda’s question, but it was hard to explain that to her.

“Well...not exactly. We don’t know the actual cause of cancer. Whoever can figure out the single cause of cancer will get a Nobel Prize.” I trailed off, uncomfortable, because I knew that helping Glenda to understand and deal with Max’s cancer diagnosis could take hours. The next clients were waiting.

We both knew that I was avoiding her questions.

Glenda sighed and said she would call me the next day to discuss it further, after she had time to digest the bad news. I quickly took out Max’s biopsy sutures, dispensed a new pain medication, and showed Glenda out into the reception area.

The visit had taken over half an hour. I hurried to see the next patient and get on with my day.

On my way home that night, I thought of poor Max and Glenda. I remembered how Max limped out of the exam room, still in pain from his surgery and what we now knew to be bone cancer. The more I remembered about the appointment, the more powerless I felt.

The more powerless I felt, the more awful my day seemed. And even worse, it was a pretty typical day.

I am a vet with many years of experience in the clinical trenches. I have a special interest in dog cancer and unfortunately have seen more than my share of cases. I've seen mammary cancer, bone cancer, mast cell tumors, hemangiosarcoma...I've seen them all.

Too often I spent my days at the Veterinary Hospital repeating the same lines over and over: "Your dog has cancer...Radiation, surgery, chemotherapy... crummy statistics...no other options." And then I would rush this poor dog lover out the door so I could get to my next appointment.

I didn't know it yet, but I was trapped in a mindset that I had been trained to think was scientific...when it was actually just closed-minded.

But something about Max's biopsy and my conversation with Glenda had cracked open a little door in my mind. And the door was opening wider and wider as I drove home that night. Light was flooding in.

Something is very wrong with this picture, I thought as I turned into my driveway.

I graduated from Cornell University, the top veterinary school in the country. I had been in practice full-time since 1997. I had all of this information in my brain, and all of this incredible experience, and yet the real options for Max were totally limited, and none felt right.

Why couldn't I give Glenda the time and energy she really needed on this dark day? I am a dog lover from way back—the earliest photos of me always include a dog—and Glenda's plight got me in the gut. Her world must have been turned upside down, but I couldn't give her what she really needed: good answers and a solid plan. And maybe just as important, hope and comfort.

I sat in my driveway and looked up at the stars, ignoring the glowing lights of my house and the inviting smell of my wife Allison's home-cooked dinner. I sat there and stared because what was really bothering me were Glenda's persistent questions.

Did Max's diet *actually* contribute to his cancer? What was the *real story* on vaccines? Are dogs affected by *toxins* in our environment?

The common belief in veterinary medicine is that cancer isn't caused by any one thing. Some say genetic tendencies are at fault, others say it's just unfortunate circumstance, and many say it's both.

But as I stared at the night sky, my conscience nagged at me.

When *was* the last time I really checked out the latest cancer research?

When *was* the last time I read original cancer literature?

Were chemotherapy, radiation, and surgery *really* all I could do for Max? Was he getting short-changed? Why did I have this gut feeling that the best veterinary education was not providing enough for him?

What else could I do, besides what I had been trained to do?

I decided then and there that I was going to find out what else I could do to help Max and Glenda, and every other dog and dog lover who walked into my life.

And once I found out *what* to do, I was going to *do it*.

This book is the result of that soul searching. But when it comes to helping dogs like Max and dog lovers like Glenda, it is just the beginning.

## May I Be Your Virtual Vet?

If you are reading this book, you are likely a dog lover and you likely have a dog with a cancer diagnosis.

If that is true, then I want you to think of me as your virtual vet. This book contains everything that I would tell you in person, if I could.

For over a year I devoted myself to studying every aspect of canine cancer treatment. I've read every paper I could find, talked to every researcher I could contact on the phone or by email, and followed every lead in a search for answers about dog cancer.

I left no stone unturned, from the most traditional veterinary medicine to the farthest far-out reaches of alternative medicine. I have traveled wherever the trail of answers led me, sometimes leaving conventional veterinary care far behind.

In the course of my research I have discovered some amazing things with profound clinical application. I have found ways to extend survival times, improve life quality, and in some cases, even eradicate the signs of cancer.

Most of what I talk about in this book will be big news to other vets. It was to me before I did my research.

Some of my recommendations will seem unusual or experimental, and others might just sound silly. That's OK. Most of this book is not what we learned in school—even at the best vet school in the U.S.

If you read the extensive endnotes at the end of this book, you will see that everything I say has been backed up by real research. It's a funny thing, but this wide-ranging search for dog cancer answers has actually reinforced my personal faith in the scientific mindset.

By that I mean that I test out theories before I commit to them. I do not say that something will or won't work until after I see the evidence. As a veterinarian, I also take a hard, objective look at the true risks and benefits of every treatment. I don't accept anything at face value, and I always ask, "What are the implications?"

I am only interested in one thing: finding treatments that work to reduce or remove cancer from a dog's body. I have sifted through all the hyperbole, sales pitches, and gobbledygook, and come up with a cancer approach that works. Now it is time to share that plan with more people than those in my practice here on Maui, Hawaii.

This book is what I wish I had been able to give to Glenda on that day years ago.

I hope you will allow me to guide you now as I wish I had guided her then. Turn the page to get started.

## This Book Does Not Substitute for Your Veterinarian's Guidance

One other thought before we get going: this book and my advice are in no way a substitute for professional, in-person care from your own vet. I do not recommend that you follow any advice for treating cancer without having a vet examine your dog and do an actual biopsy to verify the diagnosis.

A lot of what I recommend I would not advise for a healthy dog, or for a dog that is sick with an illness other than cancer.

Because of this, I urge you to bring your vet into the conversation we have in these pages. Let me help you work closely with him or her in treating your dog.

**Section I:  
My Dog Has Cancer...  
Now What??**

# Chapter One: But I Thought Everything Was Fine!

*“Everything has been normal. Now you are telling me my pet has cancer. You must be making a huge mistake. How could this be happening out of the blue? Why didn’t you catch it before now?”*

The day your vet told you that your dog has cancer, everything changed.

I think of it like this: one day you were driving the back roads on a summery Sunday afternoon, taking in the breeze and enjoying the scenery with your dog hanging out the window, tongue flapping and a big grin on her<sup>1</sup> face...when all of a sudden you found yourself freezing behind a sled in the Iditarod, the great Alaskan dog sled race.

Your dog is the lone sled dog, and the 1,150 miles of ice, mountain, wind, and snow ahead of you two look absolutely daunting. And there’s nothing you can do but push ahead, mile by mile.

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<sup>1</sup>Throughout this book I alternate using “he” and “she” to refer to your dog, rather than using a more cumbersome “he/she.” I will also alternate genders to refer to your veterinarian.

That summery day feels like another lifetime.

## Beginning the Cancer Iditarod

I call this journey the Cancer Iditarod. Once you find yourself on it, you must follow all the way to the end. There are no easy off-ramps on this highway, and you must get used to the rules and the pace.

It's totally possible to do this, especially since your partner is your dog—probably your best friend and the best team player you could wish for.

This book is going to guide you step by step down the Cancer Iditarod.

If you're like most dog lovers, you still can't believe you are on the Cancer Iditarod.

Maybe you are still reeling from the revelation as you read these words. This is totally normal, but I wouldn't be doing my job if I didn't tell you a few important things right now:

1. A cancer diagnosis is serious, and whether you want to be or not, you are in charge of your dog's treatment. You are your dog's best-qualified Primary Health Advocate—especially after you read this book from start to finish.
2. Clearing your head and understanding the contents of this section is fundamental to understanding the rest of this book.
3. Understanding and absorbing all of the information in this book will enable you to make good choices about your dog's treatment.

I say this because I know that many of you will be tempted to completely skip the first section of this book as you read along. This first section deals with some of the emotional and big-picture aspects of dog cancer.

I have put this section first for a reason, and did so after deep thought. So I ask you to trust me, read through this whole book from beginning to end, and wait until the last section on Making Choices to make any actual decisions about your dog's cancer treatments.

Here's why: reading about the causes of cancer, about what cancer does to the body, and about sometimes grim survival statistics can get pretty

heavy. You are already likely in a pretty unhappy place, and reading the information here could be even more overwhelming.

This book is designed to ultimately give you hope and a clear plan for action. But you must put all of the information into a clear head, in order to make sure that you make the best decisions for yourself and your dog.

That's why I am starting off with getting your internal world—your emotions, your vision, and your hopes—in line before we delve into the meat of the information.

I know how uncomfortable some of you may be with this approach.

Those of you who are very analytical may think, “I just want the facts. This stuff is too soft, and won't do me any good.”

I understand this point of view, because it is typically my first inclination. As a scientist, I like to “get to the good stuff,” the facts and figures and the metrics. But I have found that when dealing with cancer, one factor is the most important.

That one factor is you, and your ability to think clearly, absorb information, and make good decisions. And good decisions include not just facts and figures, but also the “soft stuff.”

On the other hand, you may be very comfortable with acknowledging and expressing your emotions. You may find the upcoming exercises a breeze, but get overwhelmed when you look at the stark facts and statistics, and then become paralyzed when it comes to making a decision.

For you, skipping ahead without mastering those emotions—which this section will help you do—would make for unclear thinking and less-than-optimal choices based on pure gut instinct unbalanced by facts.

As I discuss my approach to cancer treatment, you will see I find “soft” treatments—mind, body, and soul therapies—essential to managing cancer. With such a ferocious foe, you cannot neglect any treatment that works.

Preparations for the Cancer Iditarod focus as much on attitude as on endurance, and you must do the same. Let's start with exactly where you are at this moment. You're still probably overwhelmed by your dog's diagnosis...so let's address the first question that most clients ask me.

## How Could My Dog Be Sick Almost Overnight?

It can seem almost unbelievable to a lot of us when our dogs are diagnosed with cancer. Often the dog has been acting fine, in no apparent pain. How come there aren't more concrete signs?

There are a couple of reasons for this. The first is actually built into a dog's genetic, instinctive makeup.

When we look at dogs, we get information by what we see. Most of us see things like:

- My dog is eating a meal.
- My dog is walking with me.
- My dog wants to play.
- My dog is sleeping.
- My dog is going to the bathroom.
- My dog is happy to see me when I get home.

Over time, we use this information to create a picture in our mind of what is normal for a dog, for our dog. We tend to assume that our dog is healthy or normal if he is eating, walking, playing, sleeping, and other things are the same as they have been before.

The problem with this assumption of health is that dogs are very different from humans in one important way: they will do everything they can to hide an illness for as long as possible.

Why would they do this? Because in the wild, if you are sick or slow, you are also lunch.

Predators look for sluggish, old, and sick prey to hunt, because these animals are easier to kill.

Meanwhile, pack animals will often leave the old and sick behind to keep them from slowing down the whole group.

Despite generations of domestication and thousands of years of companionship, protection, and enjoyment, our dogs are still thinking like

wild animals in this respect. Your sweet dog is programmed to think that you will leave him behind if he gets sick.

See why he might instinctively hide an illness?

When a dog gets so sick that her body can no longer mask the illness, something happens that we call decompensation. Decompensation is when behavior changes noticeably and a dog starts acting sick.

Maybe your dog suddenly stopped eating. She ate breakfast and a treat, but then refused dinner. Or maybe she stopped drinking water, or stopped chasing the ball around the yard.

It is only after decompensation that dog lovers notice something is wrong and take the dog to the vet.

Some people feel very frustrated and guilty when I tell them this, like somehow they should have seen the signs earlier, despite their dog's efforts to hide them. Let me tell you a little story to explain why you should not beat yourself up.

Imagine you wake up one morning with a really bad headache. This headache is so bad you just want to go back to bed, but you have to go to work for an important and busy day. You look for aspirin in your medicine cabinet, but there is nothing there.

You are already late for work, and there is no time to get aspirin from the store, so you just hope the headache will go away.

You get a quick breakfast and drive to work. Your day is like it was yesterday, but you feel like garbage because your head feels like it is being squeezed in a vice. You come home, go to the bathroom, watch some TV, call a friend, have some dinner, and eventually fall asleep later that night, head still throbbing.

Now imagine someone who didn't speak a word of your language watching a video of your day. You ate, walked, drove, worked, used the bathroom, watched TV, made a call, ate again, and went to sleep.

Unless the observer was a psychic, he would have no idea there was something wrong with you!

Compare these human activities with the ones we use to paint a picture of what a normal, healthy dog is like. Pretty close, right? Our dogs can experience unpleasant things and we may have no idea, because animals are not able to tell us in our language how they feel.

Before decompensation begins and the dog loses the ability to mask the illness, it is impossible for most people to tell with certainty that a dog is ill.

Still, you may be wondering:

## Why Didn't My Vet Catch This Earlier?

Even though pet owners can't always tell if something is wrong, and even though our dogs can't tell us how they feel, shouldn't our vets be able to sense when something is wrong?

Unfortunately, the answer is no.

There are many cancers that are not visible on the outside of the body, or cannot be felt by the vet during a physical examination. Symptoms of these cancers typically do not show up until very late, usually after the cancer has spread.

Well, what about giving the dog tests to "catch cancer" early?

Cancer can take years to develop to the point where it can be found with lab tests. And despite my fervent wish that it were otherwise, there are no blood tests for most dog cancers.

Advances in the field of dog cancer are a little behind those of human cancer. Some of the most common human cancers can be found through simple tests that measure certain markers in the blood, but veterinary medicine has only one blood test for one type of cancer, lymphosarcoma. And this test is very new.

We do have routine check-ups, blood and urine testing, and imaging techniques such as X-rays and ultrasounds. We also have biopsies and another testing procedure called fine needle aspirate, which uses a tiny needle to take a small sample of a tumor.

These tests can help to spot cancer early, but they are not foolproof. There are two reasons why these tests don't often catch cancer early.

First of all, in order to increase the odds of a successful intervention, these tests must be performed when our pets are still acting healthy. Most dog lovers do not take their dogs to the vet when there isn't something obviously wrong with the dog.

The second reason is that many vets are hesitant to recommend extensive and expensive testing procedures when owners are so often under financial pressure, and the dog seems outwardly healthy.

To sum up, cancer is silent, steady, and hard to catch early.

In Section II we'll go into a lot of detail about how cancer starts, spreads, and maintains itself, but for now I want to refocus a little. I'd like to give you a mantra that you should repeat to yourself over and over as you read this book:

## A Cancer Diagnosis Does Not Equal Instant Death

You may know a woman who had breast cancer, but had no idea she had it before the doctor found a lump. Her body was healthy and performing all of its normal functions. She did not feel sick...but she actually had a cancer. Still, she had time to get treatment and live a good life. Maybe she beat the cancer into remission.

This is often the case in our dogs. Sometimes just the word "cancer" sounds so big and huge and scary that we think if we looked it up in a dictionary, we would see the definition: "death sentence."

And then our fearful thoughts can make it seem like that death sentence is going to be carried out any moment. We start mourning our dog's passing long before it's even close to a reality.

This is dangerous, because it is inaccurate thinking that leads to emotional overwhelm, which can then lead to bad decision making about cancer treatments.

The fact is, as we will learn in Section II, normal cellular processes often go awry in your dog's body. Sometimes these altered cells set the stage for later cancer development. What the dog's body does with those altered cells makes the difference between developing cancer and staying healthy.

Does the body fight off those altered cells, overcome them, and re-establish normalcy? Or is the body too weak to do that? Does it eventually allow cancer cells' growth and succumb to cancer's effects?

As you and your dog embark on your Cancer Iditarod, it is very important to remember that cancer is a living process that happens in a living body. It may not be affecting every part of the body equally.

In fact, dogs are incredible beings, capable of the best, most healing attitude on the planet: unconditional love. So let's not count them out before their time, OK?

Speaking of your dog's attitude, I think this is a good time to explore it a little more. Let's look at life from your dog's perspective.

## The Incredible Canine

I believe that many times we are completely in the dark about what our dog is experiencing. Frankly, we're missing out.

We go about our day, occupied with our own activities and thoughts. But how many times in the day do we deliberately try to feel our animal's experience? How often do we make the effort to see beyond their eating, playing, sleeping, and going to the bathroom?

Science has shown us that dogs are not only our dearest companions, but they are some of the most incredible beings on the planet. Dogs have been documented to have the following abilities:

- The ability to actually smell the emotion of fear. Your dog is probably more upset by your fear over his cancer diagnosis than by his own aches and pains.
- The ability to hear way beyond our normal range. Have you ever seen your dog freak out because she hears a storm coming?
- The ability to sense when a loved one is about to arrive. Ever had your dog greet you at the door?
- The skill to sense where someone has been, even days later. Police often use hounds to find missing children. If your own child were lost, your dog would be a likely candidate to find him.

- The ability to tell if someone wants to harm you. Remember that time when your dog stood between you and someone else, and gave that low growl? Make no mistake—that person had bad intentions.
- The ability to feel earthquakes before they start. The dogs living in Thailand in 2004 knew long before their owners that an earthquake had happened, and they tried to get them to leave their homes for high ground.
- The ability to know when an epileptic is going to have a seizure. Epileptics are often assigned therapy dogs just for this purpose.
- The ability to detect cancer in a person just by smelling their breath. The dog's nose is a remarkable instrument of science.

Dogs are, in one word, incredible.

Keep their strange, nearly magical abilities in mind as you read through this book. One of the most important things I have learned about dogs is that they can do almost anything—especially when they have the love of a calm, balanced human to sustain them.

The first section of the Cancer Iditarod is to make sure that you, your dog's owner and friend and teammate, are in the best shape possible.

You are mission critical. The next chapter gives you tools to help you keep yourself in good shape for the fight.

## Chapter Two: You Are Mission Critical

I know a diagnosis of cancer can be terrifying and overwhelming. I've seen clients burst into tears, start to shake, and be unable to drive home because they are so upset. I've also seen clients go numb and turn to stone in front of my eyes. I've even had clients ask me to put their dog down right then, without considering the decision at all, just to "get it over with."

I don't think poorly of any of these owners. I don't they lack compassion or love. They are just faced with an overwhelming event, and are having emotional reactions.

These reactions are the first obstacles to overcome on your own personal Cancer Iditarod.

When you received the news of your own dog's diagnosis, you may have felt your own world turn upside down. You may have felt so out of control that you "lost" yourself for a little while (or maybe you still feel that way).

And you may have looked at your vet and wondered what could possibly be going on in his mind.

I admit it, vets can sometimes come across as—at best—hassled and hurried and—at worst—uncaring and detached.

Believe me when I say that we don't want to be this way. We all got into veterinary medicine because we are passionate about animals. In my case, I also happen to have a profound connection to dogs that goes way back to my childhood.

The sad thing is that the average vet does not have the time, and in many cases the information, to walk people through the initial stages of

coping with dog cancer. This is unfortunate and unacceptable. Every dog owner deserves access to the information they need.

My goal as a vet has become simple and straightforward: empower my clients to become their dog's primary health advocate by coaching them along the Cancer Iditarod and giving them the full range of available information about cancer, not just what I have learned in school or been sold by a drug company.

I know your ears perked up in the Introduction when I spoke about eradicating the signs of cancer. You might be thinking, "YES! That's the good stuff, Dr. D.! *Let's get to curing my dog!*"

But as your new virtual vet, hear me say this: while effective cancer treatments are certainly covered later in this book, focusing on those things is actually *not* the first step in dealing with your dog's cancer.

Surprised? Before I did all this research, I would have been, too.

"What could be more important than starting treatment?" I would have said. "Why twiddle your thumbs when there is *cancer* on the loose?"

But my attitude has changed based on the data in my possession, my own experience in my clinic, and the time I have spent reflecting back on all the years of my work.

Ready for the vet coaching I promised you? This is a critical piece of information that I have learned over the years:

*Reducing your own emotional overwhelm about your dog's cancer diagnosis is your primary responsibility right now.* Here's why:

## You Must Put On Your Own Oxygen Mask First

You have probably been on an airplane when the flight attendant says, "In the event of an emergency, when oxygen masks are deployed, please put on yours first before assisting small children or others traveling with you."

Did you ever wonder why they say that?

It's simple, really. If you are gasping for air and about to pass out, you can't help those who really need you.

Putting on your oxygen mask first in a plane emergency is what we call a mission critical action. Without ensuring that you can breathe, you will not be able to survive or help anyone else survive a plane emergency.

Paying close attention to this chapter and doing the exercises in the next—even though they might not seem important—is mission critical to healing your dog’s cancer. You must get into a state of mind where you can be most effective as your dog’s primary caregiver. You have some big decisions to make, and they require a clear mind. Your ability to focus and be totally available to your dog—who really needs you—is your number one job.

Feelings such as guilt, numbness, hopelessness, blame, sadness and maybe even despair are all okay. They are natural, normal feelings under these circumstances. Trust me.

A few months ago I thought my dog, a Chow Chow named Björn, had a cancer of the mouth.

As I waited for the biopsy results, I felt worse than bad. I felt totally overwhelmed. I blamed myself for not being vigilant, for not doing this research sooner, for what I had fed him, and for how I had not known—a vet with a passion for eradicating dog cancer!

Björn and I were lucky and the tests came back negative, but I will never forget how I felt at just the *idea* that Björn was sick with an aggressive mouth cancer common to his breed.

And I also know from my personal experience, clinical experience, and research, that if you do not manage your emotions—notice that I said manage them, not eliminate them—they will run you into such an exhausted state that you will not be able to focus.

*“The greatest mistake in the treatment of diseases is that there are physicians for the body and physicians for the soul, although the two cannot be separated.”*

*--Plato*

By all accounts, Plato was a pretty smart guy. His advice was sound and has been scientifically proven. Treating the body while ignoring the mind and soul is a little like changing the oil in your car but never putting any gas in it. It just won't run.

Since what you are going through as a pet owner will influence the outcome for your dog, we start with you. You are mission critical. You are the link between your dog and the necessary healing.

In the next chapter you will find exercises that clear out the mind and get your head and heart in the right place.

Obviously, I do not *really* know you and your dog, but here is what I do know: if you do what I ask of you now, you may find it easier to handle every aspect of dog cancer, and you will hopefully feel as if a heavy weight has been lifted off of your shoulders.

I know this because I have been there many times, and I have seen it with my own eyes.

You may be tempted to skip ahead to later chapters; to find out the research and “get the answers.”

But learning about the causes of cancer and the available treatments when you are still reeling from a diagnosis can be disheartening at best and downright depressing at worst. So think carefully before you skip ahead.

My strongest recommendation as your virtual vet, as a man of science, and as a fellow dog lover, is to go through the exercises that follow before you move on.

I will go into much more detail in later chapters about how to become your dog's Primary Health Advocate and work with your vet, who is likely a caring, smart person and is a key member of your cancer treatment team.

But first, turn the page to get started on the mission critical task of clearing your mind to help heal your dog.

## Chapter Three: Managing Yourself to Manage Your Dog's Cancer

Will you do me a favor right now? It's no big deal, I promise.

First, check a clock or a watch and make a note of what time it is, either in writing or in your mind. Great.

Now turn your attention to your body, it doesn't matter where, but take notice of the first part that strikes you as feeling uncomfortable. Maybe it's stiff, or numb, or sore. Or maybe it feels jumpy or irritable. Just notice it.

OK, good. Now take your attention and direct it to the sensation of your breath moving through your nose, or your throat, or your chest, or your belly. Take three slow deep breaths, one after the other. Focus only on your breath and how the sensations it creates.

Thank you. Now turn your attention back to the body part you noticed earlier. What does it feel like now?

For the vast majority of people, if they really paid attention to the breath and breathed really deeply and slowly, the discomfort they noticed before has definitely shifted to a more comfortable feeling. For many, it is gone completely.

Now look back at the clock or your watch. What time is it? How much time passed? If you're like me, it's a little less than two minutes.

In less than two minutes you have taken your stress levels down a notch or two, oxygenated your body and your brain, and you probably feel calmer and more relaxed in your thinking.

Not bad for a few minutes of effort, right?

In a little bit I'm going to ask you to do some very useful and powerful exercises to get you started on the right track to helping your dog with his cancer.

But first I wanted you to notice that it doesn't take long to feel better. Take a moment now to check back in to your body and repeat the exercise—notice an area, then focus on your breathing, and then go back to the area and notice what's there now.

Feels even a little better, right? The effects of this exercise are cumulative. The more you do it—taking just a couple of minutes each time—the better you feel. This is true for you, and true for your dog.

It might be even truer for your dog than it is for you, but we'll explore that later.

Coming to terms with your bad feelings and emotions about your dog's cancer—like you just did with an area of discomfort in your body—is very useful, because it makes you stronger.

When you try to make decisions while feeling bad in any way, you are prone to making bad decisions that actually don't help much.

But when you regain control or master your emotions, by acknowledging the reality that you are in a certain emotional state and also taking steps to mitigate the emotions' effects, you become strong and more likely to make good decisions.

So take some time to do the following six exercises, keeping in mind that they are making you strong—strong enough for the job ahead, to help your dog with her cancer.

Try doing these in order for best effect. But if you can't, don't sweat it. You can pick one to do now and come back to the rest later. If you choose to do only one now, I cannot stress enough how important it is that you follow through and engage in the rest at a later time—and the sooner, the better!

OK, here we go, with Exercise 1:

## Exercise 1: Vent if You're Bent!

Many, many dog lovers who are dealing with a cancer diagnosis in their dog get angry, or “bent out of shape.”

It is understandable to be experiencing some degree of anger at this stage. Maybe your vet missed something along the way. Perhaps you talked to someone who just doesn't get how terrible this is for you, and frankly, it made you irritated or even truly enraged.

It could be that you have other problems, and this is just another really rotten problem that is piled on the other rotten things that are happening right now.

Anger is an emotion that often leads to action, and that can make it feel good—like it's “doing something.”

But here's the problem: anger can cloud your mind so the thing you do is not actually a help. Better to release the anger by venting it in a safe way.

Ready? Go somewhere where you will not be disturbed and start venting in whatever way it feels good *for you*.

Yell at a wall, scream into a pillow, run full blast around the track, pound sand on the beach, scribble angry words in a notebook, slash at a paper with crayons, do whatever expresses how bent out of shape you are.

Don't hurt anyone, of course. Don't scream obscenities at your spouse, or kick your kids, or break someone's window. And don't hurt yourself, either—that won't help your dog. Stay safe.

If anyone questions why you're doing this, tell them your vet told you to vent if you're bent. Show them this book as your note from your doctor.

Keep venting until you literally run out of steam. You'll know when it happens. You'll feel exhausted, and the venting will peter out. You might feel less “bent,” less rigid, and more like a puddle. You might cry a little, or sigh a few times, or just stare off into space. You might just feel empty.

Venting helps you get the anger out of your system so you can refocus and make good decisions to help your dog heal.

While you're on the Cancer Iditarod with your dog, whenever you feel anger building up with no relief—when you get bent—vent.

Phew. That was pretty intense, right? Well, the next exercise might be intense, too, but in a very different way—and you will directly connect with your dog!

## Exercise 2: Message Massage

Some dog lovers feel overwhelming pain and sadness at the news of their dog's cancer. You might just want to make this problem “go away” because the thought of cancer in your dog feels so uncomfortable. Or maybe you've gone a little numb, kind of like suspended animation.

It can be emotionally sickening to feel so powerless in this situation. One way to help cure this is to find ways to express your love for your dog. Expressing love in the face of great pain is a wonderfully freeing action.

A great way to express your love directly to your dog is through massage.

Yes, massage for your dog! Every dog likes it, yes, you can do it, and you *should* do it.

Massage is not hocus-pocus. An extensive review of the medical benefit of massage was published in 2004, and the medical results are remarkable.

During the study, the people who received a single massage experienced reduced anxiety, lower heart rates and lower blood pressure. Those who received more than one massage experienced reduced anxiety and depression *to the same degree as they would have with psychotherapy.*

We can't bring our dogs to a psychotherapist, but we can give them the same benefits, and even more, by using massage on a regular basis.

I can hear the excuses already. You may think that you have tried massage, and your dog doesn't really like it. You may think he or she is too wiggly, is too small, or doesn't really seem to feel it much.

Not true. Dogs love massage. In fact, it's what they do for each other. Your dog may even do it for you, without you realizing it.

The trick to dog massage is learning to massage like a dog.

Dogs in packs massage each other with their tongues. They have extremely strong tongues and they use them for social interactions in the pack.

Like us, dogs give massages when they are in a care-taking mode. If they really want to show their care and affection, they will go on licking without stopping for as long as it takes. Ever had a dog lick your feet for a long time? That's their way of massaging you.

Every massaging dog lick has a simple message, whether the dog is massaging another dog or a lucky dog lover.

The message to a dog's massage is, "I love you."

So, how can you use this natural way of interacting to help your dog? Think about it, and you'll see. Everyone feels a little better when they hear "I love you" from someone they love, your dog included.

Here are some pointers for giving your dog a loving message massage:

- **Tip One:** Think like a dog and mimic a dog's tongue in your massage. Use only use as much force as a dog tongue would, at least initially. Use repetitive, circular movements on the skin overlying large muscles. Do not use pokey finger tips, knuckles, or anything else that has an edge. Keep your fingertips, palm, or hand flat. Be soft and repetitive.
- **Tip Two:** Don't attempt to give your dog a massage unless he or she is very relaxed. Dogs in packs don't massage each other when they're wrestling—they do it when they're lazing around. Some dogs need to be exercised first. Pick a time when your dog is lying on the ground or is quiet.
- **Tip Three:** Start slowly, as your dog may not be used to this motion coming from a human. Build the massage time according to your dog's comfort. He or she will let you know how you are doing. For the little ones, be gentle! Use your finger tips like you are softly finger-painting.

- Tip Four: Focus on the following areas:
  - The muscles on top of the neck.
  - The muscles on the left and right side of the spinal column.
  - The muscles on the left and right side of the skull.
  - The shoulder muscles.
  - The thigh and hamstring muscles (the backside of the thigh).
  - The muscles on the front and back of the calf and forearm.

Now that you've told your dog how much you love him in a way that he really understands, it's time to say thank you.

### Exercise 3: Pledge of Thanks

Many wise people around the world say that gratitude is very healing. I have found this to be true, even in dog cancer.

This exercise may not benefit your dog in a directly measurable way like some of the others in this chapter, but I would not be surprised if your dog is at least picking up on your overall intention, which must feel good.

The pledge of thanks is pretty simple. You just take time to thank your dog for everything he or she has given to you. You might pick a quiet place where you can both get comfortable while you do this, so you don't feel silly if someone overhears you.

Sometimes it helps to write each item down first, but it is important that when you thank your dog you do so with words, spoken out loud.

Just trust me on this one. This is not the time for silent meditation.

While you give thanks to your dog, the important thing is to allow yourself to actually *feel gratitude* for each of the gifts you include in the pledge. Tears are allowed! Don't hold back.

Give thanks for anything you can think of. Some examples might be:

- Your dog was there for an important day or event.
- Your dog does something really well.
- You love walking your dog on a crisp fall day.
- You feel good when your dog is happy after a meal.
- You are grateful when your dog joins you for a night's rest.
- You love how your dog greets you when you come home.
- It's possible you just feel good looking at your dog.
- Your dog protected you one time and stood by you.
- You watched your dog grow along with you.
- Your dog loves the car, and you love having him there.

Think about everything you've been through together. Be as complete as possible. This might take you a longer time than you expected, once you get started.

Say everything in your heart until you run out of specifics. Then you can simply say, "Thank you, thank you, thank you," until you are left with just the feelings of love and the words simply stop.

Out of all the pieces of advice that I give in this whole book, this is one of the most important. When you are done, you will know why.

After bathing your dog in gratitude, it's time to get going!

## Exercise 4: Dynamic Dog

What actually determines a good life?

That question can kind of blow your mind if you think about it too long. You can consider this question in a variety of different ways.

One way to answer it is to say that a good life is one where you are "realizing life potential."

Going for one's full potential can happen in any area of life. Maybe you're a runner, and you want to be the best runner you can possibly be. Or maybe you are a natural student and love to learn a subject thoroughly. Maybe you have a big heart and want to share your love deeply in your relationships.

There are so many areas where you have potential, and you can realize your potential in any area you choose.

I can hear you thinking—especially you analytical types—“Great! But how on earth does this relate to my dog and my dog's cancer?”

Here's how. You are a dog lover and have a dog with cancer, or you wouldn't be reading this. You really care about your dog, or you would not be going through this exercise.

In other words, you have the potential to be the best dog lover that you can be. You can “realize your potential” as a dog lover by giving your dog the best possible life—especially amidst the dark feelings that arise after a dog cancer diagnosis.

I can hear the questions now. How does a dog with cancer get the best possible life? What can I do to realize my potential?

That's exactly what this exercise is about.

Dogs love to play and learn. New activities and gentle changes in routine, surroundings, and lifestyle help provide a dog with challenges to overcome, and they create a sense of excitement and potential fulfillment.

A life without engaging stimulation can lead to the dog equivalent of poor self-esteem. This exercise is designed to counteract that and bring your dog back to life, even a little. The key is to gently and kindly shake up your dog's life.

A dynamic dog is one who has excitement and new things to experience that are not routine. These do not have to be big things, just little variations to keep the blood pumping and the nervous system firing.

Pick one thing each day to change just a little for your dog.

Suggestions for dynamic change:

- If your dog goes on walks, vary your walking route. Reward your dog for doing well on the new route. Speed up the walk, slow it down. Praise your dog generously for dealing with the change.
- Change the feeding schedule a little (not the type of food, just the time of day).
- Give him new rewards for tasks done (new treats, new toys, etc).
- Gently provide new training for a new trick, and then follow with lavish praise.
- Go on short trips to new locations, and praise her along the way for adjusting to the new spot.
- If your dog is social, create opportunities to interact with other dogs, and then reward him for good behavior.
- Introduce your dog to new people, and then reward her for being nice.

In creating a rich life experience for your dog you will raise his self-esteem, you will bond deeply, and it will remind you that you are a team. Feeling like you are part of a good team is essential to your dog's well-being before, during, and after cancer treatments.

Speaking of lavish praise, it's time for what my grandmother calls a "mental health day."

## Exercise 5: Cheat Day

When you and your dog are dealing with cancer, you can both feel awful. Not only can there be pain and discomfort, but also fear, depression, and anger. Maybe you've done all the previous exercises, but still feel pretty crummy. Or maybe you've done them all, and feel OK, but are totally exhausted and just need a break.

Sounds like it is time for Cheat Day! *It's time to spoil your dog.*

I take the term "Cheat Day" from a diet program my wife Allison and I followed last year. We were on a very rigorous diet, but every once in a while

we got a full day of “cheating” when we could eat anything we wanted. These Cheat Days helped us to keep up with the program the rest of the time. They were a reward for good behavior and helped to avoid discipline fatigue and depression.

Dogs love Cheat Days—days when they get an undeserved, unearned, delicious reward—just because they deserve it.

And you will love Cheat Days, too, because it is good for the soul to see your dog taking pleasure.

A good time table for a dog’s Cheat Day is every 3-5 days. On Cheat Days, your dog can have a really yummy treat like:

- Chicken breast cooked in bullion
- Lean hamburger, boiled in chicken broth and strained
- Turkey breast, cubed or shredded, and cooked in diluted teriyaki sauce
- Gerber baby food (for humans), meat flavor
- Boneless fish, cooked in clear soup of your choice
- Lean lamb (fat and bone trimmed away), cooked in vegetable broth
- Peeled shrimp, cooked in beef broth
- Lean pork, cooked in chicken noodle soup
- Hard boiled egg whites chopped up in consume beef broth
- Tuna fish in water with Italian food seasoning, warmed

I hate to put any restrictions on Cheat Day treats, since it doesn’t feel quite in the spirit of “anything goes,” but I do have a few suggestions.

If you can get sodium-restricted sauces, or use salt substitute, that is ideal. But if you can’t do low-salt for some reason, it is not critical on Cheat Day.

However, since cancers like sugary and starchy foods (you’ll read more about this later) I would avoid carbohydrates, grains, and sugars. I would also

clear any Cheat Day food with your vet first, to make sure nothing in it will interact with your dog's medications or treatments.

A good Cheat Day every once in a while helps everyone to cope!

After you spoil your dog with a treat, it might be a good time to tell her a story—her Life Story.

## Exercise 6: Life Story

A good friend of mine, James Jacobson, recently went through the passing of his loved dog, Maui. Maui was a full-of-life (but very old) Maltese who was loved by many, because she was featured on James' popular website, [www.DoYouRememberLove.com](http://www.DoYouRememberLove.com).

When Maui got sick at the end of her life, thousands of dog lovers wrote to James to offer ideas for help. One of those moved to write offered an extremely valuable tool that did wonders to help James deal with Maui's illness.

I have since used this tool with many dog owners who are coping with dog cancer. They have found this to be very uplifting and freeing, and I would like to pass it on to you.

The Life Story is a way of reconnecting with your dog. Sometimes we are so busy in life that we lose some of the connection we have with our dog, or maybe we just forgot about it for a while in the hustle and bustle of our day. And if you are very upset because your dog is sick, you may actually find yourself focusing more on your own feelings than on your dog.

The Life Story is a pretty simple exercise. Sit down with your dog and tell your dog his life story. It's very basic—you just go from the very beginning to the very end of her life, and tell him everything.

Fair warning, it can take a little time to do this. You are trying to relive all the ups and downs of life as you experienced them, along with your dog's parallel experience.

The key is to allow yourself to really go back to those days with your dog. Try to remember all the details you can.

- Who was there?
- Who arrived and left?
- Where were you two?
- What did you and your dog do?
- What happened when things shifted and changed? What were the good times?
- How about the tough times?

Conclude by bringing yourself and your dog back to the present time together, with you telling the story to your dog.

Remember to include both of you in the story, and speak out loud, so your dog knows that she is included. Don't be afraid to put your hand on her, massage as you are talking, or whatever contact is comfortable for you both.

When you are done, you may feel even closer to her than you have in a long time.

## You Are Well On Your Way

My hope is that these exercises have given you some tools to clear your mind, reconnect with your dog, and spark your enthusiasm for realizing your full potential as a dog lover.

Getting yourself mentally and emotionally prepared to deal with your dog's cancer diagnosis is the crucial first step. As you progress down the Cancer Iditarod, you may feel yourself pulled off balance again. If or when that happens, come back to these exercises and use one or several to get yourself back on track.

Next up: becoming your dog's Primary Health Advocate by gathering information, double-checking the facts, and putting systems in place which allow you to really understand exactly what is going on with your dog.

For you action junkies, relief is on the way! There's a lot to cover, so let's move on to the next chapter.

## Chapter Four: You Are the Best Advocate for Your Dog's Health Care

*"The only sure weapon against bad ideas is better ideas."*

*--Alfred Whitney Griswold*

Many people simply let the doctor—human doctor or dog doctor—totally run the show.

If the doctor says, "You cannot recover," then you cannot recover.

If the doctor says, "There is no treatment," then there is no treatment.

If the doctor says, "There is nothing we can do," then there is nothing we can do.

Wrong!

Just like everyone on earth used to say the world was flat until the globe was circumnavigated, doctors may say one thing one day and literally change their tune overnight if they find out more information.

That is why so many good doctors are reluctant to make blanket statements like those above. We know that new information is always flowing in. We are always learning more and more about health care. That is guaranteed.

Doctors are human beings, like you. They may be up-to-date on the latest information, or they may not be. They may be great at reading X-Rays but not so hot at reading ultrasounds.

Varying levels of ability, experience, and plain old interest can all come into play. Different doctors have different approaches, different philosophies and different styles. You may get three different opinions from three different vets, all for a common problem.

Medicine is not black and white, but is many shades of gray. It is based on science, of course, but the practice is an art. And notice that I said the word “practice.” We practice medicine. We do not perform it.

In other words, we don’t always get things right the first time.

We are not machines and are capable of human error.

For these reasons, it is very important for you to become part of your dog’s health care team.

As a matter of fact, you need to become the boss of this team. You will be calling the shots as time goes by, and the sooner you get used to this idea, the better off everyone will be.

I can hear some of you shifting in your seat and thinking “Don’t I pay my vet to be the boss and make the choices? Isn’t that what he went to school for?”

Well, the answer is both yes and no. A vet is someone with more experience in dog medicine than you have, and more technical know-how about how to treat cancer. However, your vet is hired and paid by someone—you! This literally makes you the boss.

I am not implying that your vet does not know what she is doing. And I realize that some of you may actually prefer to have your vet make all the important decisions. I don’t want to force you to give up any feelings of security or trust.

But even if this describes you, it is important to remember that vets are there for a service. Your job is to make use of the service for the benefit of you and your dog.

You know better than your vet about many aspects of caring for your dog. You are the person in the best position to decide what is good and what is not good. You are responsible for the well-being of your dog.

*“The person who knows how will always have a job. The person who knows why will always be his boss.”*

*--Diane Ravitch*

In this case, the person who knows *how* is the vet. The person who knows *why* is you!

You know the “why” behind pursuing certain options. You will know which “hows” feel right for you and your dog.

The first step to becoming your dog’s Primary Health Advocate is to realize that you actually *are* in the driver’s seat.

## You’re the Boss, so Be the Boss!

You are the owner of your dog, and you know your dog better than anyone else. If you start a treatment but do not like what it is doing to your dog, you have permission to change your mind if need be, or change course entirely.

Don’t feel like you have that permission? Well, I just gave it to you.

I would like you to view your relationship with your vet as a working partnership, with each of you doing different jobs. Your vet’s job is to give you the *hows* of treatment and their best advice based on their experience. Your job is to see if their *hows* fit your *whys*.

To fully empower yourself in your new role, I recommend starting by making sure that you have a full understanding of your dog’s illness.

From my years of being a full-time veterinary doctor and surgeon, I have compiled the following list of useful suggestions for asking your vet questions.

This list will help you better work as a team to help your dog.

## Questions to Ask Your Vet

Going over this list—first by yourself and then with your vet—will make everyone’s life a lot easier, clearer, and efficient.

- First, give yourself permission to ask whatever you want to. Don’t be put off by the “Doctor” title in front of her name! Vets are normal people, just like you. You should speak to them as equals. Also, remember that your vet should speak to *you* as an equal. If he doesn’t, it might be time to find a new vet.
- Make a list of questions and bring a pen and paper, or a tape recorder. Vets often have little time, and would prefer to give information once and have you record it, rather than having to repeat things over and over.
- Ask for the correct spelling of any medical terms. This allows you to research on your own if you want further clarification or more information.
- Schedule a consultation (in person or via telephone) at a specific time. Vets’ days are full, and it is very useful for them to have time blocked off for specific purposes. Usually the telephone calls are free, and sometimes a fifteen minute consult in person is offered as a courtesy as well.
- Don’t be afraid to ask the big picture questions. Vets can get preoccupied with the medical details right in front of them, and overlook how the plan fits into the grand scheme. They also may assume that you have their level of understanding without ever actually giving you the information you need.
- Ask about expected outcomes and statistics. As you will learn in this book, every dog’s illness is unique. Your vet’s expectations should not be taken as absolutes, but getting an idea of the overall direction and outcome is really helpful to avoid misunderstandings and to prepare for the future.
- Ask about the possible side effects of drugs or treatments you have agreed upon. For example, a common drug used in chemotherapy is prednisone, which stimulates thirst. After taking the medication, a dog may begin to drink two or three

times the normal amount of water. This is a common, benign side effect, but vets sometimes do neglect to inform dog lovers of it. From your standpoint, seeing your dog drink twice the normal quantity of water might be quite alarming. Side effects from drugs can be potentially serious, even life threatening at times, and it is critical to have a clear idea of what to look for.

- Ask your vet how much experience they have had in dealing with your dog's type of cancer. There is an important difference between book learning and real world know-how, and good vets know this and acknowledge it. There is no substitute for hands-on experience. What is their level of expertise in your dog's particular kind of cancer? If it turns out to be a lot, great. If this is the first time they have dealt with it, however, you may want to call in a specialist or ask that your vet gets some supervision. While many vets may experience bruised egos at hearing something like this from you, it is absolutely within your right to ask for it. On behalf of my fellow vets, I ask that you please be tactful, of course.
- Find out how open your vet is to what I call the Full Spectrum approach to cancer care. I discuss my approach in detail later on, but for now here is what I mean in brief. Most vets are allopathic, or conventional doctors. This kind of medicine is what they teach in vet school in America. Some vets, though, are alternative or holistic, an approach that emphasizes whole body support and correction of deficiencies. The problem with either school of thought is that it tends to reject the other and exclude treatments that could be helpful. In Full Spectrum Cancer Care, I use selected treatments from both allopathic and holistic approaches. The Full Spectrum approach uses, as much as possible, a rigorous science to evaluate efficacy. It does not matter where the treatment comes from—if there is science to back it up, and results can be seen, Full Spectrum Care dictates that we should consider using it. A critical part of this method is the avoidance of personal bias and prejudice. This is what you have to ferret out when talking to your vet. How does she see “the other side” of the medical profession? Does he think, “Western medicine does more harm than good”? Does she think, “Those holistic guys are quacks”?

- Discuss the potential costs of your treatment plan. Treating cancer can be expensive. You should have a frank discussion with your vet on estimated costs, and get it in writing. Most vets have estimate forms, which they should be happy to fill out and give to you for budgeting purposes.
- Tell your vet your own philosophy. As you continue through this book, you will probably become clearer on your treatment goals and guiding principles. For example, you may get a really firm grasp on what side effects you are willing to tolerate in order to gain certain benefits, and which you are not willing to tolerate. As you become clear, be sure to share these ideas with your vet. It is important because it will help supplement the treatment plan that he or she will recommend to you. In this way your needs, as well as your dog's needs, are met.

As you empower yourself to be your dog's Primary Health Advocate, there are a couple of other things you must do. First up:

## Get a Copy of the Pathologist's Report

All of the information in your dog's record is yours. You literally own it. You are legally entitled to copies of anything in your dog's medical file. Your vet may charge a minimal fee to cover the copying costs, but you have access to the content by law.

Your vet should have a copy of the pathology report saying that your dog has cancer. This report is sent to the vet's office after a specimen from the cancer is sent to the lab. Most cancers are diagnosed in this way, with very few exceptions.

The report can be a little heavy on scientific terms, but you can get good information from it. I suggest you ask your vet go over it with you and explain everything. The reason for this is you want to make absolutely sure you have concrete evidence of cancer.

The report may also contain uncertainties that you should discuss with your vet. There may be a question in the pathologist's mind about the cancer; the diagnosis may be uncertain. The pathologist may suggest another biopsy.

Once you establish the diagnosis is correct, I have another task for you.

## Get a Second Opinion

Surprised? When you're looking at a biopsy report with your vet and it very clearly says "cancer," it may seem irrefutable.

But you really need to make sure that there is indeed a confirmed diagnosis. Occasionally, we vets make mistakes. You don't want to start painful, time-consuming, possibly expensive cancer treatments when there is no cancer there.

I know you may feel loyalty to your vet. That is okay. It is only natural, and it is the sign of a healthy relationship between you two. However, any true veterinary professional will respect your wishes and honor the request with no problem, and may even refer you to a colleague.

Most of the time the initial diagnosis is correct, but a second opinion is truly worth it.

## Keep a Journal

As your dog's Primary Health Advocate, it is your job to keep track of his health. The best way to do this is in a journal.

Cancer treatment can get very complex as dosages are lowered, increased, stopped, started, diets changed, surgeries scheduled...it can get really overwhelming. Keeping a journal allows you to chart your progress and review things without relying on memory, which can shift and change during difficult times.

The journal also helps you start thinking like someone involved in animal healing. It allows you to tune in to details you might miss otherwise. You will soon find your observation skills are sharpening considerably. It also helps you to maintain the team attitude that is so important on the Cancer Iditarod.

You can use any kind of paper you like. A spiral notebook is fine, or a binder with loose leaf paper.

Start your journal by recording a description of your dog when she is as normal as possible. How much does she eat, and when, and what? How often does she drink? Take a walk? Sleep? Get as detailed as possible. This gives you a baseline picture of your dog to compare to later, when things start changing.

From there, you should track as many of the following as possible. Don't worry if you don't get to all of them every day—any information you have in writing will help you and your vet to track your dog's progress and tweak a treatment schedule as time goes on.

Things you could focus on in your journal:

- When medications were given, how much, and their resulting good or bad effects.
- When other treatments were given. Did they help or not? Any bad side effects?
- Diet: When were diet changes made? Did the changes help? When did you see the positive effects? Any problems with the new diet or certain ingredients?
- Appetite: When did the change occur, if any? Was more or less eaten? What was actually eaten? What was turned down?
- Thirst: More water gone from the bowl? Less? How much?
- Energy level: Alert? Tires easily? Spunky? Lethargic? A little off? Really down?
- Weight: Gain? Loss?
- Vomiting: When? Color? How often?
- Stools: Diarrhea? Mucus? Blood? Amount of stool? Straining?
- Coughing: When? Moist? Dry?
- Sneezing: Nasal discharge? Clear or yellow/green? Any blood?
- Panting: When? For how long?
- Labored breathing: When? For how long?
- Vocalization: When? Barking or whining, or something else?
- Coat quality: Hair loss? Any sores on limbs or elsewhere?
- Any limping or reluctance to move around?

- Color of gums: Salmon pink or pale? White? Yellowish?
- If directed by your vet: rectal temperature?
- Changes in the cancer, if visible: Size of tumor? You can measure it or have something to compare it to, like “a golf ball” or “a pea.” Surface appearance of the tumor? If surgery was performed, is the incision healing well?
- Mind-Body: What is your read on your dog’s overall feeling? What is the look in your pet’s eyes? What do you sense your dog is going through?

Use this list to tune in to some of the subtler changes that might be occurring during your dog’s cancer treatment.

On another note, you may want to use the journal to write about what you are going through personally. It is very helpful for some people to record experiences and feelings along the way.

## Discussions with Friends, Family and Children

You will certainly find yourself talking about your dog's cancer, and not all of those discussions will feel great.

Here are a few pointers that can help soothe some of the feelings that can come up in these talks.

1. If good friends and family seem insensitive, try to remember that they are often very worried about you. Many times those close to us get very worried when we go through something like this. Unless they have really been through it themselves, they cannot understand what it is like to be in your shoes—especially if they are not dog lovers. This is unfortunate, but also not their fault. They probably want everything to be OK for you and your pet, but don’t know how to make it a reality. They may instead come across as dismissive or detached. This may not feel good to you. Try to remember that behind what you see or hear, they really want everything to be all right again. Do your best to respect their input as coming from a loving place.

2. Don't tell people everything is "fine" if you don't believe it. Sometimes people will try to reassure you with, "Everything will be fine." This may sound a bit dismissive. For most of us, having a dog diagnosed with cancer is not fine. It is OK to be honest about this. It is really disconcerting, awful news. It is perfectly okay to be sad, afraid, angry, guilty, frustrated, etc., especially when you are using the exercises from earlier in this book to master those feelings. When you are honest it helps the other person be real, too, which usually improves things. Try to respect the viewpoint of others while still being honest with your feelings. They cannot know what it is like to go through this. They are doing the best they can, just like you are.
3. Young kids (and sometimes grown-ups) often immediately assume they caused the problem. They will act, in their way, as if they did something bad. It is up to you to let them know it is not their fault and they are loved just as they are. Sometimes older kids will accuse and finger-point, thinking someone is to blame. They might say, "You shouldn't have fed him that cheap food," or "Dad shouldn't be smoking around her." Realize they are afraid on the inside, even if they don't admit it. Include them as someone "in the loop." Let them know developments as they come up. Get their feedback and listen without criticism as best you can. Acknowledge their input as important. Knowledge can help soothe them, and your attention and love will help as well. The more empowered they are as Health Advocates, the more support you can get during this time with cancer. Some of the most dedicated cancer partners I know are kids, who make sure the dog always gets their medications on time.
4. Discussing the possibility of a pet's death can be a challenge. It is helpful to bring up the topic with everyone in the family. This is not because we want to focus on death. That would be self-defeating. The truth is, though, that thoughts about your dog's death will arise at some point. These thoughts need to be tended to. It can be very helpful to come to an agreement on whether or not you feel your dog has a soul or a spirit that will pass on. Personally, I believe that there is a part of the dog that is indestructible, that cannot be

touched by disease or death. I find this very comforting. You may think so, too.

*“If having a soul means being able to feel love and loyalty and gratitude, then animals are better off than a lot of humans.”*

*--James Herriot, Veterinarian and Author*

Talking about your dog’s cancer can be very emotional and draining, and I applaud you for every time you do it. Talking with your close ones increases intimacy, which is an important part of your own support system as a Primary Health Advocate.

Let’s turn our attention to other resources for help and support.

## Reach Out For Support

No matter how strong you are, if your dog has cancer, you are scared. I’ve never met anyone who wasn’t affected by it.

So if you are a stiff upper lip type, listen up. You must admit that this is a hard situation, even if you only admit it to yourself. If you are fighting to stay tough, you are using valuable energy that is better spent helping your dog fight cancer.

Talking with others close to you can help. So can talking to people you trust, like a priest, pastor, rabbi, or other religious figure. Maybe you have a counselor or therapist. Some people prefer to just talk it over with a friend and a beer.

Whatever your way, let those you trust know what is going on.

Most veterinary schools have support lines for dog owners, which are staffed by knowledgeable veterinary students. These lines are usually monitored by professionals. Go online and search “veterinary school support line” for the numbers.

The internet can be a good resource. There are many online support groups for owners of dogs with cancer.

It can help tremendously to talk to people who are going through the same thing. Believe me, there are a lot of people just like you.

## Financing Your Dog's Cancer Treatment

One of the most discouraging parts of being a vet is that treatments cost money, sometimes lots and lots of money. When a person wants to do absolutely everything medically possible, and is unable to afford the treatment, it can be horrible.

We are seeing the same thing now in human medicine, where people who need certain treatments are unable to afford them due to limited insurance coverage, or complete lack of it.

Surgery, chemotherapy and radiation—the standard treatments for cancer—can cost in the ballpark of \$5,000-\$8,000 these days, maybe more depending on where you are located. This is a lot of money to most people.

Later in Section IV, we will look at each of these in detail, and weigh the benefits and potential risks of each. But here I would like to bring up two points.

First of all, compassion, energy and love don't cost a cent. You can do a huge amount for your pet that is free. Focusing on making your pet as happy as possible—which happens to be Step Six of my Full Spectrum approach to cancer care—is doing a great deal to help your dog.

Secondly, spending money on extensive treatment does not always produce a happier animal.

We will go into life quality analysis in Section V, but it is an important part of becoming your dog's Primary Health Advocate, so I will briefly address it now.

Sometimes treatments don't work. What happens in life is often out of our control. Cancer really shows us how true this is. What is always in your control, however, and what makes you the best candidate for Primary Health Advocate, is to love your dog.

Even just petting your dog communicates your love. By focusing on the love you share, you will not only help your dog in the most powerful way you can, you will also help yourself to be in a loving state, not a fearful state.

And a powerful, loving state of mind is the single best way to describe the ideal Primary Health Advocate.

Of course, you can do all of these things and still find that the vet bills are an issue.

The list of organizations below may be a place to start when looking for assistance with medical bills.

If you have a purebred dog, there are also local or national groups that offer help. Do an internet search using your dog breed and terms such as “bills,” “cancer,” “financial,” “rescue,” “assistance,” etc.

#### **Organizations That May Help With Medical Bills:**

- **ANGELS FOR ANIMALS:** General financial help for pets: [www.angels4animals.org/index.html](http://www.angels4animals.org/index.html)
- **UNITED ANIMAL NATIONS LIFELINE:** General financial help for pets: [www.uan.org/index.cfm?navid=161](http://www.uan.org/index.cfm?navid=161)
- **CANINE CANCER AWARENESS:** Help for dogs in need of cancer treatment: [www.caninecancerawareness.org](http://www.caninecancerawareness.org)
- **CODY'S CLUB:** Financial help for dogs in need of radiation treatment: [codysclub.bravehost.com/cc-requests.htm](http://codysclub.bravehost.com/cc-requests.htm)
- **HELP-A-PET:** General financial help for pets: [www.help-a-pet.org/apply.html](http://www.help-a-pet.org/apply.html)
- **IMOM:** General financial help for pets: [www.imom.org](http://www.imom.org)
- **PET FUND:** Non-emergency financial help for pets: [www.thepetfund.com](http://www.thepetfund.com)
- **PIGGER'S PALS:** Financial help for owners seeking oncologists or surgical specialist services: [www.piggerspals.org/mission.html](http://www.piggerspals.org/mission.html)

- AAHA Helping Pets Fund: General help for sick pets if your veterinarian is a member of AAHA (American Animal Hospital Association): [www.aahahelpingpets.org](http://www.aahahelpingpets.org)
- Helping Harley Working Dog Cancer Treatment Grants: For working dogs with cancer (service dogs, assistance dogs, etc): [www.grants.landofpuregold.com](http://www.grants.landofpuregold.com)
- OSLF Fund For Orthopedic Cases: Financial help for pets needing amputations or treatment for help in movement: [www.oslf.org/petsneed.htm](http://www.oslf.org/petsneed.htm)
- LABRADOR LIFELINE: Financial help for labs: [www.labradorlifeline.org/index.html](http://www.labradorlifeline.org/index.html)
- SAVE US PETS: Financial help for pets in New Jersey: [www.saveuspets.org/about\\_saveuspets/info\\_pet\\_owners.html](http://www.saveuspets.org/about_saveuspets/info_pet_owners.html)
- ANIMAL CANCER THERAPY SUBSIDIZATION SOCIETY: For pets with cancer in Alberta, Canada: [www.actssalberta.org/application/](http://www.actssalberta.org/application/)
- GREEDY OR NEEDY: A make-a-wish site. Not specifically for dog care: [www.greedyorneedy.com/how-it-works](http://www.greedyorneedy.com/how-it-works)

Clinical trials are also a way to get new treatments at reduced costs. You may live near a vet school or large research facility that is conducting trials on new treatments.

These are almost always strictly allopathic, but can be of use for pet owners interested in surgery, chemotherapy and radiation. The Perseus Foundation keeps an active list of clinical trials:

[www.PerseusFoundation.org/new/ctd.cfm](http://www.PerseusFoundation.org/new/ctd.cfm)

## Important Points to Remember

Sometimes it can be helpful to do a little review. We just covered a lot of material designed to help you become your dog's Primary Health Advocate. Let's review the major points now.

- Animals have a tendency to hide diseases. When their body can no longer hide the problem, they can act sick very suddenly. This is called decompensation, and animals do this because they still

have the instinct to hide from predators by acting very healthy even when they are not.

- Veterinarian's tests for cancer at this time are very limited compared to human physician's tests.
- A cancer diagnosis does not automatically mean a death sentence.
- Cancer may not be affecting the rest of the living body. Cancers can be completely asymptomatic—recall the diagnosis of a woman with a lump in her breast.
- Your dog has abilities that are beyond the human realm. Dogs experience life differently. It can take a little work to really empathize with what is going on in the dog's world.
- Become your dog's Primary Health Advocate. You are in the driver's seat. You will be the one making decisions, so saddle up and take the responsibility for your dog.
- You may find it very beneficial to complete one or more of the exercises in Chapter Three. These exercises will likely help you connect with your dog and rein in your own emotions, which will make coping with cancer an easier experience for both of you.
- You are your vet's boss. It is tempting to relinquish the role of Primary Health Advocate to your vet, but you need to be the supervisor so you feel confident that what is being done is the right choice for both you and your dog.
- Reference my list of questions to ask your vet, and get the answers. If you don't understand something, ask again. There is important information you need to know in order to be the best possible Primary Health Advocate for your dog.
- Review the biopsy report with your vet. Make sure you have a clear understanding of the situation. Get a copy for your records.
- Get a second opinion. Everyone is human. We can all make mistakes, and this includes veterinarians.

- Keep a journal or diary to record what is happening with your dog. Use the list provided to help you track progress.
- When talking to others, remember that the people you are talking to will have their own reactions to the diagnosis, and these reactions may have nothing to do with you. Allow others to express themselves, but be honest with how you feel, too.
- It is OK to discuss death with your family, friends and vet—but don't focus on it for prolonged periods. Allow normal, natural thoughts about passing on to be dealt with as they arise. Eventually, we all die, and this may be a learning opportunity to deal with a subject that makes many people feel uncomfortable.
- Reach out for the support that you need. You are not alone. There are many resources available to help you. Some are listed on my website at [www.DogCancerSurvival.com](http://www.DogCancerSurvival.com).

**Section II:  
Everything You Need to Know  
About Dog Cancer**

## Chapter Five: Cancer Basics

*“Nature does not hurry, yet everything is accomplished.”*

*--Lao Tzu*

Well, here we are. This is the first section where I start to throw some big words and scary concepts at you. I’m not going to sugarcoat anything, because I know that you have the tools you need to deal with whatever comes up for you.

I also know that if you read and understand everything in this section and the rest of this book, you will be in excellent shape to handle your dog’s cancer.

In this chapter I’m going to go over the broad basics of what cancer is, how it comes to be in the body, and how the body tries to deal with it. I’ll also define some basic terms you need to know.

In later chapters we’ll get into details about the many possible triggers for your dog’s cancer, and the amazing systems your dog’s body deploys to try to control cancer’s growth.

Take this section slowly—keep in mind Lao Tzu’s quote. Don’t hurry this. Know that all will be accomplished if you keep putting one foot in front of the other in your own personal Cancer Iditarod.

By the end of this book, you will have a plan and the knowledge and confidence to carry it through.

But first, let's learn a little about cancer. We'll start with some vocabulary words.

## Words You Need to Know

All of these are important terms for you to know. Vets often throw these terms around casually, never bothering to define them—so pay attention:

- **Angiogenesis:** The process by which cancer tumors form new blood vessels from surrounding, otherwise normal tissue. These blood vessels supply the tumor with the nutrients, energy and oxygen intended for healthy tissue. This is one of the ways tumors rob the body of nutrition and feed their own growth.
- **Apoptosis:** The body's process of programmed, healthy cell death. This is completely normal and natural. All cells have a lifespan. When one cell dies it makes room for a new cell in the body.
- **Benign:** The term for a growth or tumor that does not spread and usually is not dangerous. A benign growth can increase in size, though, which can interfere with normal movement. It could also tear or burst open, which can lead to bleeding or infection. We normally do not use the word benign to describe a cancer.
- **Cancer:** Broadly defined, cancer is an uncontrolled growth of cells in the body. These cells invade the surrounding tissue, which causes harm. They can also form a tumor, which can grow to be quite large. Sometimes the tumor can be surgically removed and the body can be free of the cancer. Sometimes, though, these harmful cells can invade the body by infiltration, or slipping into healthy body parts without forming a tumor (local invasion). Other times cancer cells spread around the body via the bloodstream (metastasis), landing in other sites where they start new growths and cause further harm.
- **Cell:** These are tiny “building blocks” of the body. Bones are made of millions of microscopic bone cells, the liver is made of countless tiny liver cells, and the heart is made of countless heart cells, and so on throughout the body. Over 10,000 cells can fit on the head of a pin.

- **Hard to Cure:** Hard to Cure is my phrase to describe cancers that have historically resisted conventional medical treatments.
- **Initiation:** The first part of a developing cancer, initiation is the process whereby damaged cells start the uncontrolled growth that takes a cell from normal to cancerous. Promotion is the next stage in cancer development.
- **Local Invasion:** When cancer spreads by travelling through the normal tissue next to the tumor.
- **Malignant:** A word used to describe an uncontrolled, cancerous growth of cells. We usually use the words “malignancy” or “malignant” when we are talking about cancer.
- **Metastasis:** When cancer spreads through the bloodstream. The cancer cells enter the circulatory system and flow through the body, attaching to new areas and forming new tumors.
- **Micrometastasis:** Micrometastasis is like metastasis, in that cells spread throughout the body via the circulatory system. However, these cells do not form tumors right away. Rather, they are cancerous cells that have the *potential* to become full cancers later. Sometimes these altered cells escape during treatment and cause a recurrence of the cancer in new sites at a later date.
- **Oncology:** The study of cancer. An oncologist is doctor who specializes in cancer.
- **Promotion:** The second part of cancer development, after initiation. It is when the immune system is unable to dispose of the damaged cells that are growing out of control, and cancers—or tumors—form.
- **Staging:** A way of classifying or evaluating cancer to determine how far it has spread throughout the body.
- **Tumor:** A growth, mass or bump, made up of cancerous cells. Tumors can be classified as benign (generally not dangerous) or malignant (dangerous). However, in common use, tumor has come to mean the same thing as malignant. Likely if your vet refers to a tumor, she means a malignant tumor.

I will try to remind you of these definitions when the words come up later in the book.

Now, let's take a closer look at cancer itself. Let's look at where cancer is found—not where it is found in the body, but where it is found on the planet.

## Cancer Rates Accelerating In Developed Countries

In the past few decades, cancer rates have shot up in the United States and other developed countries. Cancer used to be very uncommon, but since 1950, the rate of human cancers *not* caused by cigarettes has increased 27%.

Several things are going on to create our cancers...and rates are set to escalate even more in the coming years.

Many experts call cancer a “disease of civilization.” Other diseases of civilization include diabetes, obesity, asthma, depression, arthritis, heart disease, high blood pressure, and stroke.

Sound familiar? Of course they do. It is likely you know several people with one or even more than one of these very diseases. They're so widespread in the developed world that it's almost become “normal” to have them.

But it's not normal.

In a little while we're going to go into detail about the causes of cancer—including environmental and dietary causes—and you'll see how we can, with the proper intent and will, actually reduce the risk of cancer.

There are several things that need to be done, and the experts have many recommendations. Dr. Paul Kleihues, Director of the International Agency for Research on Cancer, and co-editor of the World Health Organization's *World Cancer Report*, writes, “Cancer rates are set to increase at an alarming rate globally...[but] we have the opportunity to stem this increase. Action now can prevent one third of cancers.”

We can prevent *one third* of cancers, just by changing our lifestyles!

The real tragedy for us dog lovers is that we are not just seeing cancer rates increase in the developed world's human population.

We're seeing cancer rates increase in our beloved dogs, too.

The lifestyle choices we make for ourselves—like what we choose to eat, and how we manage stress—affect our health, and we know it. What we may not realize is that those choices are also affecting the health of our dogs.

Our dogs are like a mirror for what is going on with us humans.

## Cancer Initiation: How It Begins

If your dog has cancer, there is a serious problem in her body.

Cancer starts simply enough, with one or two normal, healthy, cells hard at work performing daily functions to support a healthy life...Suddenly, they go a little crazy.

The cells start dividing way too fast, and they do not die their natural, well-timed death (apoptosis).

The cells are now multiplying out of control. They are creating new cells that do the exact same thing—grow way too fast and refuse to die. Pretty soon there are thousands or millions of cells multiplying and growing with no end in sight. Normal cells get crowded out, killed, absorbed, or interfered with. It's havoc.

You may be wondering, "But how can this happen?" So let's look at this a little more closely.

We'll start by going deep into the cells themselves, into their hearts, to see what happens to initiate cancer.

### DNA Mutation and the Beginning of Cancer

You have probably heard of DNA, the mysterious stuff that governs the body and contains all of the blueprints for every individual cell in the body.

And you've probably heard of genes, too. Genes are made of DNA and act kind of like cell managers. They run each body cell from within by reading

the DNA's blueprint for their cell, and carrying out the actions associated with that blueprint. There are many genes in each individual cell, each gene controlling a different aspect of that cell.

Since your dog's body is basically a huge bunch of cells, all of the functions of your dog's body are controlled by genes. They are mission control. Genes control the whole body, from birth to death.

Every cell has its very own specialized active genes. For example, if a cell is part of your dog's liver, the liver cell genes activate, ensuring that the cell does things that the liver is supposed to do. The genes make the cell behave like a liver cell.

If a cell is part of your dog's lung, it would have lung genes active and they would make sure the cell behaves like a lung cell.

Cells that develop into cancer have genes that are not working properly. Here's what happens.

Certain genes in the cell control cell growth. They behave like the gas pedal for cell. These genes turn on and the cells grow so your dog's body can develop or heal.

For example, when your dog's body grew from a puppy to an adult, these genes controlled that growth. Likewise, when your dog's body has an injury, like a cut that needs to heal, these genes grow new cells to heal the cut.

Meanwhile, other genes act like a brake pedal for cell growth. They turn the cells off, or slow them down. For instance, when your puppy grew big enough to be an adult, these genes made his body stop growing. Or if a cut has healed, these genes stop the growth of new cells.

One set of genes in the cell can start growth. Another set of genes in the same cell can stop growth. It's exactly like the gas pedal and brake pedal in your car. One tells the car to go, and one says to stop. When the cell is working properly, these two are in balance and working together.

But sometimes the DNA inside the genes is defective or has been harmed. When DNA is damaged, it is called a mutation. When this happens, the genes can get confused about who does what, or they just stop doing their jobs altogether. The brake pedals don't function and the gas pedal is stuck all the way down.

This is the beginning of cancer. When a cell's DNA is changed or harmed or defective, and the DNA in the genes does not work properly, it can become a cancer cell.

In both humans and dogs, cancer takes a long time to develop. Many injuries to the DNA can occur before the cell actually turns into a cancer cell.

Cancer is said to be initiated when enough damage is done to a gene controlling the growth of a cell that the cell starts dividing fast and uncontrollably (cancer proliferation), as if it were a cell in a puppy trying to become an adult. Except in this case there is no puppy growing into an adult, there is just uncontrolled growth because of a defective gene.

The “grow” messages from the genes become so deranged that the cells literally start dividing out of control, forming new, harmful growths.

There is no brake pedal gene to control the growth and make a nice healthy new cell. And there is nowhere for these new, defective cells to go. Instead, the extra cells form tumors, which interfere with surrounding tissue and refuse to do the job of the original cell. For instance, if the tumor is in the liver, it does not act like a liver cell, even though it came from liver cells.

The damage to the DNA makes the cell act like an alien.

To make it worse, every newly formed cancer cell contains the same DNA of the original cancer cell, including the DNA mutations in the genes, and the intent and capability to perpetuate growth. Because the new cancer cells can multiply just as fast as the first one did, their numbers grow exponentially, and the problem in surrounding tissues gets worse and worse.

This can all sound pretty grim and pretty alarming. But what not many people know is this: it is very normal in our dog's bodies (and our own bodies, too) to have many cells that are on their way to becoming cancer cells.

In fact, every day there are about 10,000 measurable mutations in mammal DNA.

In other words, it's actually OK to have DNA mutations—rather, it's normal and part of being a living being. It is fairly easy for damage to occur on the cellular level and change the DNA in that cell. It happens all the time.

## Cancer Promotion: How It Continues

These little genetic mutations inside cells only start, or initiate, cancer. In a healthy body, these cells are found and destroyed by other, special cells that are actually designed to kill mutated cells so that they don't cause problems later!

These “good guy” cells are part of the immune system, and we will talk about them in detail later. The main point right now is that as scary as all of this talk of cells growing out of control can sound, it's important to know that the body has a way of dealing with those defective cells. In a healthy body, the immune system can handle them.

That is, unless the immune system is compromised somehow. When the immune system cannot dispose of the damaged cells, cancers form. This second phase of cancer is called cancer promotion.

Why would the immune system allow damaged cells to survive and form cancers? Well, the reasons usually stem from lifestyle factors that actually suppress the immune system and make it less functional.

We're going to be talking about this a lot later. The promotion stage is largely ignored in conventional veterinary cancer care, but I think there is a lot we can do to inhibit cancer promotion. Preventing promotion is part of the key to stamping out cancer.

Here's a summary of what we just learned about how cancer is formed in the body:

1. DNA is harmed. (Initiation.)
2. Genes within that DNA no longer perform well.
3. The damaged genes that control cell growth turn on uncontrolled cell growth and cell division.
4. The cell starts multiplying uncontrollably.
5. The new cells carry those same defective genes, and they start multiplying uncontrollably to form tumors.
6. The immune system cannot dispose of the cancer cells. (Promotion.)

7. Cancer is now established in the body. Tumors continue to multiply and grow.

Most vets concentrate solely on surgery, chemotherapy and radiation to treat cancers. But these techniques only focus on removal of the tumors once cancer has rooted itself in the body. If you remove the tumor but even one cancerous cell remains, and if the immune system is still not able to find and kill that cell, you will have a recurrence of cancer.

That's why I address every step of cancer development in Full Spectrum Cancer Care. If you go back as far as possible, you can re-establish balance in the body. If the immune system is strong, it will help the body fight the cancer, as it is designed to do.

There are many factors that can lead to DNA mutation and problems in the body. The focus of this book is to address all of those factors and do everything we can to improve lifestyle, not just remove tumors that can come back later.

## Cancer Spread

Unlike other diseases, which tend to stay localized in the area of the body where they started, cancer spreads out, overtaking the body and eventually destroying it if nothing is done to intervene.

Cancer cells can spread in two ways.

The first way cancer spreads is by sending out cancerous cells into healthy neighboring areas. This is called local invasion.

To visualize this type of cancer spread, picture a crab. (Cancer is actually the Latin word for "crab.") Ancient physicians thought that an invading tumor looked like a crab, where the body of the crab was the tumor and the legs of the crab appeared as cords of cancer cells invading the surrounding tissues.

The second way cancer spreads is by flowing around in the circulatory system. The cancer cells can get into the bloodstream or the lymphatic system and course through the body. Some cells will attach to new areas in the body and start forming another tumor. Once this happens, we say metastasis has occurred, or the cancer has metastasized.

Different cancers spread at different rates, and almost all of them spread silently, in subtle ways. Often we don't find out about cancers until they are well entrenched in the body, even metastasized.

## Staging

One part of your vet's evaluation of your dog's cancer will be to "stage" the cancer, or to find out how far the cancer has spread.

This helps your vet get an idea of the cancer's severity, and it also helps in figuring out what treatments should be considered. Once your vet knows what stage the cancer has reached, he can form an idea of which treatments will work and which will not. He will also be able to give approximate predictions about treatment success.

The system used for staging the cancer will depend on what type of cancer you are dealing with. Cancer progression can be measured in several ways.

One way is to simply measure the size of the tumor—the bigger the tumor, the later the stage.

Lymph nodes are also checked during staging to see if the cancer has entered the lymphatic system. The lymphatic system circulates lymph throughout the body. Lymph is fluid that carries white blood cells, and it is an important part of the immune system. A collection of tiny tubes connects organs and other body parts to glands called lymph nodes. These tubes carry the lymph between the glands and the organs. The lymph nodes act as filters to catch and destroy invaders like bacteria and other microbes.

Cancers can grow within the lymph nodes, and they can also spread through the body via this system, just like they can through the bloodstream. Often the lymph node will be sampled with a needle or examined during surgery to see if there are cancer cells there. Many times a vet can detect a swollen node during a routine physical, which will prompt a sampling. If cancer cells are found in lymph nodes near the site of the cancer, the stage is classified as more advanced.

If the cancer has entered the bloodstream or the lymphatic system, it can travel to distant sites deep within the body, which commonly include the liver, spleen, lungs, and bone marrow.

Staging also includes checking internal organs for cancer spread. Often, imaging tools like X-rays or ultrasounds will be used to check deep in the body. If wide spreading has occurred, the stage is more advanced, because the cancer exists in multiple locations.

One of the tricky things about staging is that there can be cancer spread that is actually not picked up by any of these tests. There is a phenomenon called micrometastasis, which is the spread of cancerous cells through the circulation into other body areas. These cells have not yet multiplied enough to make large tumors that can be detected by tests. Since cells are so tiny, these cancerous cells are often totally invisible to our medical instruments. Micrometastasis can make cancer treatment much more difficult, because when things are undetectable we can't deal with them.

Those cancerous micrometastatic cells may cause a tumor to pop up in a new location later.

## Hard to Cure Cancers

Whatever kind of cancer is developing in the body, a late stage cancer will more likely be Hard to Cure.

I use the phrase Hard to Cure to describe cancers that have historically resisted conventional treatment. If a dog's cancer is deemed Hard to Cure, dog owners can expect a grim prognosis, because the likelihood is that the cancer will win in the end.

Another technique to help vets identify if the cancer is Hard to Cure is to look at the known "behavior" of the tumor type. Each type of cancer has a general progression in its behavior and does different things to the body.

Some cancers are very good at sending micrometastases out into distant sites in the body. These will later grow into metastatic cancers, even if the original cancer was removed. Capability of metastasis is one thing that makes a cancer very malignant, aggressive, or "hot"—all words used to describe cancers that are Hard to Cure.

Other types of Hard to Cure cancers are aggressive by sending out cells into their surrounding neighborhood, a process we discussed earlier, called local invasion. Local invasion is similar to micrometastasis, except that the cells spread by simply traveling through the tissue next to the tumor, rather than traveling through the circulation. Also like micrometastasis, local

invasion cells are tiny and can be impossible to detect sometimes. They can form new tumors later, along or close to the location of the first tumor.

Once the vet assesses the behavior of the tumor, he or she can better tell if the cancer is Hard to Cure.

The rate of cancer growth also gives us information. If the cancer grows very rapidly, it may be quite Hard to Cure.

Another issue is if the cancer is too big, too spread out, or in an area that cannot be operated on without endangering the dog. Another word for an inoperable tumor is non-resectable. This means the cancer cells cannot be removed through surgery. Non-resectable cancers are usually Hard to Cure.

## Making Choices about Cancer

I realize how hard this can all be to take in. If you are like most dog lovers, you might want to throw the book away in despair right now. I understand that reaction, and hope that you will continue reading with me straight through to the end.

It is so important to know this information, and then to read the Making Choices section last, in order to make the best decisions for your dog.

I know it stinks. Cancer is really, really, tough. And it's just not fair—in my opinion—that sometimes all the medical attention in the world is not enough to beat out a cancer. There are limits to what we human beings can accomplish, and this includes all branches of healing. The sooner we accept this truth, the sooner we can focus our energy on doing what we can to make things better.

If you need to take three slow breaths now and refocus, please do so. If you are ready, read on, because what I have to say next is important.

Even if a cancer is judged Hard to Cure, a diagnosis of cancer is not an immediate death sentence. There can still be good quality of life for a period of time. Your job is to keep your dog as happy as you can for as long as it makes sense. This is the best thing you can possibly do for your dog—keep up his or her quality of life, and show as much love as you can.

Sometimes we are forced to look at palliative care, or what I call dog hospice, which is care that focuses on making things easier. This is one of the

hardest things to do, but the most rewarding for you and your dog—to love fully despite the pain of separation.

One of the reasons for this book is to help you make things better. Later, we'll cover everything you'll need to help you to make the best choices, both in treatment and, if you need it, palliative care.

In the next few chapters we'll cover more about how to stop cancer from spreading and make it possible to deal with more effectively.

But first, it is important to learn more about what can contribute to cancer developing in your dog in the first place.

When you are ready, turn the page to the next chapter to learn more.

## Important Points to Remember

- Understanding cancer takes time. Be patient.
- It seems the many causes of cancer are all around us, part and parcel of civilization.
- Cancers are often not found until very late in the disease.
- DNA mutation is the first step in developing cancer. This is also called cancer initiation.
- The body is supposed to catch these mutated cells and stop the growth of cancer. Problems in the immune system cause this repair to fail, which allows for cancer promotion, or the uncontrolled growth of cancer cells.
- Cancer starts in one area and then spreads to other areas. Spread occurs by metastasis (going to distant sites) or local invasion (into surrounding areas).
- Staging is used to determine a cancer's severity, and then to decide the best treatment plan. Late-stage cancers are Hard to Cure, or historically more aggressive and resistant to treatment.
- Be patient with yourself as you learn more about cancer. It can be very scary, but you can handle it.

## Chapter Six: Causes of Cancer in Dogs

After the initial shock of hearing your vet give you a cancer diagnosis, you may very well have asked him, “What caused this?”

And if yours is a typical vet, he probably shook his head and said, “We can’t say, exactly.”

And he was right to say that. One of the most frustrating facts about cancer is that there is almost never one, single, solitary cause. There are many possible causes for cancer in dogs, including:

- Carcinogens
- Oxidation and free radicals
- Chronic inflammation
- Over-breeding of bad genes
- Spaying, which can increase the risk of some cancers
- Not spaying, which can increase the risk of some other cancers
- Sunlight and radiation
- Viruses

As you may remember from the last chapter, many of these causes actually stem from living in a developed country, and many are tied to lifestyle choices we have partial or total control over.

In this chapter, we will cover each of these causes in detail. Let's start with a big one that we can actually do a lot to control in our dog's lives, carcinogens.

## Carcinogens

Most of us have heard of carcinogens, but we may not know what they actually are. Carcinogens are substances that cause cells to start dividing uncontrollably. In other words, they are cancer-causing agents.

And they're everywhere. We are exposed to carcinogens all the time. There are hundreds of cancer-causing substances and agents in our food, water, and air. Here are just a few of those that most often affect our dogs:

- Nitrites, nitrates, and ethoxyquin in dog food
- High temperatures used to process dog food
- Asbestos
- Water-borne carcinogens like pharmaceuticals, fluoride, and heavy metals
- Airborne carcinogens like second-hand smoke, fossil fuel pollutants (like exhaust from cars), pesticides and herbicides
- High voltage power lines

We'll go over these in detail in a minute. But first, it is important for you to know that there are legal limits on the amount of carcinogens to which humans and animals are allowed to be exposed.

Safety studies are conducted to look at the potency of known carcinogens. The studies examine the amount of a carcinogen that is needed in order to cause cancer. These studies help regulatory agencies like the United States' Environmental Protection Agency (EPA) decide what constitutes a "safe" amount of exposure to the carcinogen in question.

Technically, all carcinogen exposure should be restricted to the legal limit. However, the safety studies looking at allowable carcinogen limits may not reflect real world situations.

In the real world, we have something called synergy, and that makes all the difference.

## Safety Studies Don't Test For Real World Situations

Most clinical safety studies look at each carcinogen in a vacuum. They do not take into account that our bodies—and our dogs' bodies—are also exposed to other chemicals at the same time.

In the real world, though, we almost never encounter just one substance at a time. When one thing is inhaled, eaten or drunk, other things are also taken into the body, or are already present in the body.

This combination of carcinogens can create synergy. Synergy is when two or more things working together have more amplified effects, above what each does when working alone.

Here's an example of synergy.

Say your dog has arthritis. If you were to give him a dose of prednisone for its anti-inflammatory effect, but you also gave a dose of aspirin for pain relief, it is very likely that one or more of the following side effects would occur:

- Vomiting
- Diarrhea
- An inflamed lining of the entire digestive tract
- Possible bleeding into the stomach or intestine
- Ulceration with perforation (holes in the wall of intestine)

All of these side effects are conceivable when using prednisone and aspirin together, especially over the long term.

But all of these side effects would be much rarer if each drug was used by itself, without the other.

A more familiar example of synergy is the combination of vinegar and baking soda, which you may have seen in a child's science project. Alone, each substance is harmless—in fact, common ingredients in cooking. When the two are combined, though, a chemical reaction occurs. The mixture will fizz, hiss, and make a big mess.

No scientist conducting a carcinogen safety study is able to tell with certainty what carcinogens will create synergy in real life, because it's virtually impossible to test every combination of substances.

In addition to ignoring the realities of synergy in the real world, safety studies also ignore another crucial factor: time.

The length of the studies is often less than the time of possible real life exposure to carcinogens. Sometimes exposure to carcinogens in real life is over many years, even a lifetime. Because of this, many studies can't predict the long term effects of exposure to a given carcinogen.

The bottom line is that safety studies cannot accurately predict all the cancer-causing effects of carcinogens. Even seemingly harmless substances that are not considered carcinogens on their own might actually cause cancer when combined with others in real life. It is hard to say definitively, without testing all of the carcinogen combinations on the planet over time.

In other words, it is possible to nail down what is *definitely* carcinogenic, but not possible to say what *could be* carcinogenic.

Let's look at some known carcinogens now. We'll start with food preservatives, which are a major culprit for causing cancer.

### Nitrites, Nitrates, and Ethoxyquin

You have probably heard of nitrites and nitrates, the preservatives that are found in many processed meats like bacon, sausage, and ham, and also in many brands of dog food. Although those preservatives do a great job of extending the shelf life of the food, they are not so good for you, or for your dog, when they're in your body.

According to the Mayo Clinic, one of the most respected hospitals for cancer research and treatment, "Both nitrates and nitrites combine with other nitrogen-containing substances in your stomach to form N-nitroso compounds—carcinogens."

So nitrates and nitrites are not carcinogens themselves, but when the body digests them, they are converted to cancer-causing chemicals.

Ethoxyquin is another common carcinogenic ingredient in pet food. You will not find it listed as its own ingredient on the label, but you may see the ingredient “fish meal.” Fish meal contains a lot of ethoxyquin.

The effects of ethoxyquin were looked at in *Carcinogenesis*, a well respected cancer journal published in Britain in 1987: “EQ (ethoxyquin) alone caused severe damage to the kidney...EQ may be exerting a carcinogenic effect in the kidney.”

Try to feed your dog foods that contain as few of these ingredients as possible. I’ll go over diet in more depth later on and give you recipes that eliminate the need for processed food for your dog, thereby eliminating the ingestion of very common carcinogens.

## High Temperature Processing of Dog Food

When commercial dog food companies make dry food products, they heat the mixture containing meat, fish, fat and animal remains to very high temperatures and push the mix through a machine called an extruder.

This extruder creates uniform treats or pieces of kibble. This is why commercial dog food is all the same shape.

Such high temperatures produce heterocyclic amines, which are known to be extremely potent carcinogens. They stay in the food, but because they are there after the food is mixed, they do not have to be listed on the label.

Between the preservatives and the high-heat processing that creates carcinogens, I strongly recommend feeding your dog higher quality, more natural food. I predict they will love it, too! Again, in the Full Spectrum Cancer Care section, we’ll go over recipes that are good for your dog with cancer and those who are not sick, as well.

## Asbestos

Asbestos is a mineral that offers incredible heat and sound insulation for walls, ceilings, pipes, and all sorts of other building materials. The only problem is that it is a known carcinogen, and an especially dangerous one.

You may remember a few decades ago when we stopped using asbestos in our buildings altogether, and even removed much of what was present, because we found out about how dangerous it really is.

Well, asbestos is back, but it's in a new place: our drinking water. According to Environmental Protection Agency studies, 18% of the U.S. population uses drinking water with more than 1 million asbestos fibers per liter, with 10% using water with more than 10 million fibers per liter.

Even the Department of Health and Human Services says asbestos is an issue: “[The] ingestion of water, food, or drugs laden with asbestos by millions of people over their lifetimes could result in a substantial number of cancers.”

Those cancers are not just in people, of course. They are also in our dogs.

A cancer that develops within the skull, called mesothelioma, has been found to be more common in dogs whose owners work with asbestos. I would guess this is due to the dog getting exposure to asbestos from the clothing or inhaling it from the air. If you work with asbestos, it's best not to bring your dog to work with you. I also suggest showering and changing your clothes before playing with your dog.

Even if you do not work with asbestos, I recommend checking out your water supply. You can ask your water supplier about which chemicals are tested for in the local tap water.

The EPA's website is also a great place to start learning about the drinking water in your area. By calling the EPA's Safe Drinking Water Hotline at (800) 426-4791, you can find out general information about your water, as well as ways to contact your state's Department of Health.

You can also contact the Community Right-to-Know Hotline at (800) 424-9346 to find out more about chemical use near you.

## **Water-borne Pharmaceuticals and Other Compounds**

The Associated Press conducted an investigative series of articles about the water we drink, and found that the vast majority of water systems in the U.S. actually contain pharmaceuticals.

Small amounts of prescription drugs have been found, including still-active hormones from birth control pills, chemotherapy agents, and antidepressants, among others.

How did these drugs get into our water supply?

After people take their medications and digest them, there may be some excess drug, which is released from the body through the bowels and the urinary tract. These active drugs flow into the sewage system, where the water is then treated to make it drinkable. It is then piped back into household faucets for normal use.

But that's not the only way prescription drugs are getting into our water. Many hospitals across America actually flush unused medications down the toilet to dispose of them! In these cases, the drugs enter the sewage system at full strength, without even being metabolized in the body.

You may be thinking that the septic treatments in the sewage system should be taking care of these drugs. And you are right—they should. But they're not.

Septic treatments are good at getting rid of germs like bacteria and protozoa, but they are not designed to remove drugs. Our dogs end up drinking these small doses of pharmaceuticals over years.

Remember our discussion about synergy? The implications of taking lots of drugs all mixed together over long periods of time are quite startling.

If nitrates and nitrites convert to carcinogens in the body, what are all of those drugs doing in the body after they are mixed in?

Right now, of course, no one knows the answer to that question, although the EPA acknowledges the problem and some water suppliers are working on it.

I have a suspicion that we will be hearing more about this as time goes on—it's too big a potential danger to ignore for long. In the meantime, my recommendation is to use water that has been purified or put through reverse osmosis to remove as many prescriptions as possible.

## Fluoride in Drinking Water

There is a large, but largely ignored, body of evidence that fluoride in drinking water likely increases the risk of bone cancer in growing boys and in rats. *The Washington Post* actually published an article about a scandal involving suppression of these research findings.

“The National Institute of Environmental Health Sciences (NIEHS), which funded Chester Douglass’s \$1.3 million study, and [Harvard] University are investigating why the Harvard School of Dental Medicine epidemiologist told federal officials he found no significant correlation between fluoridated water and osteosarcoma, a rare form of bone cancer. Douglass, who serves as editor-in-chief for the industry-funded Colgate Oral Care Report, supervised research for a 2001 doctoral thesis that concluded boys exposed to fluoridated water at a young age were more likely to get the cancer.”

I have not found direct evidence for fluoridated water causing bone cancer or other cancers in dogs, but since there is a fair amount of evidence in other species, including humans, I would not be surprised if this was a risk factor for dogs as well.

Again, I recommend checking the EPA’s website and hotlines to find out exactly what’s in your drinking water.

## Airborne Carcinogens

A lot of substances released into the air can be harmful to us and our pets, and often we don’t even realize it. These carcinogens are inhaled, increasing the risk of cancers of the nose, sinuses, and lungs. Some such substances are:

- Secondhand tobacco smoke
- Kerosene and coal household heaters
- Fumes from chemical solvents and paints
- Industrial manufacturing waste
- Hydrocarbons released from burning fossil fuels

You might not realize how many of these carcinogens your dog can be exposed to over his lifetime. If, for example, your dog spends a lot of time in a garage, he may be exposed to high quantities of hydrocarbons.

Other airborne carcinogens include pesticides and herbicides. We often overlook the impact of using these chemicals in our house and on our lawns.

The use of 2,4-D, an herbicide found in over 1,500 weed-killing chemicals, was found to increase cancer of the white blood cells, called lymphosarcoma (or lymphoma). Meanwhile, lawn pesticides are documented in causing a transitional cell carcinoma, a type of bladder cancer.

Try to limit your dog's exposure to these carcinogens. This does not mean keeping your dog indoors at all times, but simply being more aware of his surroundings. For instance, if you use a pesticide or herbicide on your lawn, keep your dog off of it for six to eight hours afterward. The same should go for any indoor pesticide treatments.

## High Voltage Power Lines

Exposure to high voltage power lines has definitely been shown to increase cancer rates. This was proven by a study in the *British Journal of Medicine*, which concluded, "There is an association between childhood leukemia and proximity of home address at birth to high voltage power lines, and the apparent risk extends to a greater distance than would have been expected from previous studies..."

The odd thing about the high voltage risk is that the cancer rates seem to increase slightly downwind of the power lines. This suggests that the cancer actually may be caused by something carcinogenic produced in the air around the power lines.

Scientists speculate that perhaps a particle called the corona ion is inhaled, causing the increase in cancers.

Obviously it is hard to control whether your dog is near high voltage power lines, but it is good to know what effect they may be having so you can move to counteract, or at least minimize, other carcinogens.

## So Is Everything a Carcinogen? How to Evaluate Safety Labels

All of the substances discussed above are scientifically demonstrated to have carcinogenic effects. They cause cancer, because they cause cells to grow out of control. You will likely hear about many more potential cancer-causing substances as you learn about your dog's cancer.

Unfortunately, much of what we hear in the media and especially in discussion forums—as helpful as they can be—are claims that are based on hearsay and rumor.

I do not trust some of the information I have come across because it is hysterical, opinionated, and not based on actual cases. Before believing something causes cancer, one should be able to find definite proof that it is a carcinogen. If I didn't find that proof, I didn't include it here in this discussion.

On the other hand, sometimes the medical establishment does not give us the whole story. Consider the following statement, often found on the back of medications or ingredient labels:

“This has not been shown to cause cancer in dogs.”

This statement may technically be true, but may also be irrelevant. Let me explain.

From a scientific viewpoint, to say *for sure* that something is a carcinogen, it has to be proven to do so in a study. The scientific method in the West (USA, England, etc.) is a placebo-controlled, double blind study.

At least two groups are involved in these studies. One group is treated with the real thing—whatever is being tested—and one group is given a placebo—a fake. Neither group's members know which they are receiving. Scientists then observe the differences between the effects of those two groups. This is a very good, very detailed approach to getting useful information.

Here's the catch: Doctors and scientists cannot and will not say that something causes cancer in dogs unless a placebo-controlled, double-blind study was actually performed to test that particular substance *on a dog*.

So if a study on dogs was never performed, then saying, “This has not been shown to cause cancer in dogs,” is both true (because a study wasn't

done at all) and scientifically sound (because some scientists never say a substance causes cancer in dogs unless a placebo-controlled, double-blind study was conducted on dogs).

The fact is, not many studies are performed on dogs. Rodents and non-human primates are used in most of the placebo-controlled, double-blind studies.

So some scientists say, “This has not been shown to cause cancer in dogs,” when they might have instead said, “A placebo-controlled, double-blind study was not done on dogs.”

While placebo-controlled, double-blind studies are very useful, other forms of studies can give valuable information, too. I’ll talk more about this a little later on.

In any case, I am not reassured when I read or hear, “This has not been shown to cause cancer in dogs.”

Another point I would like to make is that because of synergy, a substance may actually increase the risk of cancer, but only if and when certain other factors are present.

This is called a risk factor. When a manufacturer denies that a chemical or other effect “causes” cancer, they might be mincing words, if it has still been shown to increase the *risk* of cancer.

A perfect example of this is cigarette smoke in people. In 1965, cigarette manufacturers were required to print “Caution: Cigarette Smoking May Be Hazardous to Your Health” on every package. This phrase indicates a risk to your health, but not a direct link to any illness.

However, as science proved a direct relationship between cigarette smoking and cancer, emphysema, and heart disease, as well as other problems, the government required the following label:

“Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy.”

The government demanded that the manufacturer clarify to the public that cigarettes don’t pose a *risk* to your health, that rather, they *cause* illness.

It's good to pay attention to language, especially the language used by scientists and manufacturers, who are being very careful in choosing their words. Sometimes the line between "increases the risk" and "causes" can be hard to see.

If a chemical is a carcinogen in rodents and monkeys, we usually call it a carcinogen for humans. So it makes sense that if it is a carcinogen for rodents and monkeys and humans, it probably is for dogs, too.

In the end, the real problem is this: All of these carcinogens in our air, water, and food add up. They eventually have negative effects on the body of our dogs.

Now we'll look at some more potential causes of cancer in dogs. Let's go to oxidation and free radicals next. This is kind of tricky and technical, so pay close attention, and maybe take a deep breath to get your brain oxygenated.

## Oxidation and Free Radicals

Put very simply, oxidation is a form of decomposition in the body, or a kind of breaking down. Technically what happens is that an oxidant—which is a kind of molecule—takes particles (called electrons) from another molecule. This leaves the molecules "oxidized." These molecules also lose their integrity, which is why we say that oxidation is a form of decomposition.

Oxidation occurs everywhere—in living molecules and inanimate molecules—and it reminds me of fire. That's because it kind of "burns" up the cell. Like fire, oxidation can be very useful or very destructive, depending upon the circumstances.

Most examples of oxidization we can't see, because it happens on such a negligible, molecular level.

However, there are some familiar examples of oxidation. When iron rusts, it is being oxidized. When wood burns and turns into charcoal, it's oxidizing.

The body's cells also get energy by oxidation. They burn food—carbohydrates, fats, and so on—just like fire burns wood. This is a healthy form of oxidation.

However, if body oxidation starts burning cell parts that are performing important functions, oxidation can act just like a fire out of control. Then there is a negative effect on health.

So what causes excessive oxidation?

Carcinogens like those we just discussed can cause excessive oxidation in the body. When carcinogens enter the body cells after being inhaled, ingested, or absorbed, they can harm the DNA of the cell in several ways, including oxidation. In this case, these carcinogens are also called oxidants.

Just like wood turns to charcoal, healthy DNA becomes damaged after oxidation. And as I'm sure you recall, damaged DNA forms damaged genes, which, if damaged enough, can cause uncontrolled cell growth—cancer.

Another kind of molecule that oxidizes DNA and creates cancer is what we call a free radical.

The term free radical refers to its unstable molecular structure. Free radicals are quite harmful because they react very violently with normal cell parts, like DNA.

The body naturally produces oxidants and free radicals as part of the burning fuel process. This is very normal, and the body cleans these up as a matter of course.

Here's how the body naturally cleans them up:

If oxidants or free radicals are like fire in the body, substances called antioxidants are like water.

Antioxidants put out the fire in the body by directly neutralizing oxidation and free radicals. The body has a store of natural antioxidants obtained from food in the diet. The body also has proteins called antioxidant enzymes, which counteract oxidation, decrease the amount of free radicals, and produce more antioxidants.

Normally the body has enough antioxidants and enzymes to counteract the normal production of free radicals created during daily living. There is a healthy, natural cycle of creation and destruction.

However, as we have discovered, our civilized world contains many more cancer-causing chemicals than it used to. These carcinogens enter the body in

various ways, and they can use up the supply of natural antioxidants. The result is DNA injury, and then cancer can follow.

In the next chapter we'll talk in much more detail about antioxidants. For now, let's go on to another likely suspect in the development of cancer.

## Chronic Inflammation

Inflammation is the process in the body that makes things red, swollen and warm to the touch. It's actually an immune system response to injury. Extra blood and lymph is sent to the area to clean up damages.

Inflammation occurs if you get bitten by a bee, have acid indigestion in your stomach, a bad case of gingivitis, or a cut that gets infected. All of these things have the ability to trigger inflammation.

When an area in the body gets inflamed, lots of free radicals are produced. These can damage the DNA of the body cells in this area, setting the stage for mutations in the genes that control cell growth. On top of this, chemical signals are released during inflammation, which can also lead to cancer development! That's a double whammy. Inflammation can really set the stage for cancer.

Most vets do not look at inflammation as part of the cancer process, but my research has shown that is a real phenomenon. Widespread inflammatory changes in the body, or at least the release of fairly high, sustained levels of inflammatory chemical signals, can lead to free radical release, inappropriate immune system reactions, actual tissue destruction, and more.

Now, I am not saying that getting stung by a bee gives your dog cancer. Inflammation needs to be going on for a very long time—over years—to increase the odds of cancer.

That being said, when I find cancer in a patient, I can often find a long history of inflammation, too.

We will look at ways to combat inflammation in the Full Spectrum Cancer Care section. This is a very important part of my approach to dealing with cancer in dogs.

## Breeding of Bad Genes

Some problems in DNA are the result of genetics more than external issues.

That is, a dog may be predisposed to cancer because of imperfect DNA inherited from ancestors. Genetic mutations get passed along in the breed lines, from generation to generation.

Remember that dogs have been bred over many hundreds or thousands of years. These tendencies exist more commonly over many generations, so you don't necessarily see them in a dog's parents or grandparents. But if you were to look at the hundreds of generations of certain blood lines, you would likely find deformities popping up over and over again, much more commonly than a dog of a different pure breed, or in one of a mixed breed.

If two dogs with the same mutation are bred together, the pups will have a higher probability of cancer. Once there are enough mutations passed down in a puppy's DNA, you get cancer initiation.

Certain breeds are more prone to cancer than other breeds, and certain breeds are more prone to one kind of cancer over other kinds of cancers.

Many breeders will say that their pups have never had a cancer commonly found in their particular breed, and this may be true. But because we are talking about genetics and breeding over many, many generations, the tendency will likely still be there.

Now, just because a dog is a certain breed does not mean that dog will definitely develop the cancer commonly found in that breed. The dog just has a higher than average probability of developing that cancer.

The only exceptions, in my experience, are the Golden Retriever and the Boxer. Members of both of these breeds actually have a pretty high probability of eventually getting cancers. Unfortunately, if your dog is either of a Golden or a Boxer, it is fairly likely that you may be dealing with cancer at some point.

Here are some common cancers found in specific breeds. We will cover the major cancers and their conventional treatments in the next section.

## Some Breeds With Higher Than Average Rates of Malignant Cancer:

<u>Dog Breed</u>	<u>Common Malignant Cancer Type</u>
Rottweiler	Osteosarcoma
Cocker Spaniel	Lymphosarcoma
Shar-Pei	Mast cell tumor
English Spring Spaniel	Mammary cancer
Bernese Mountain Dog	Histiocytic sarcoma
Labrador Retriever	Hemangiosarcoma, lymphosarcoma
Boxer	Lymphosarcoma, mast cell tumor, cancers of the brain
Cocker Spaniel	Lymphosarcoma, anal sac carcinoma
Pug	Mast cell tumor
Chow Chow	Malignant melanoma
Giant Schnauzer	Subungual squamous cell carcinoma
Scottish Terrier	Malignant melanoma
Shetland Sheepdog	Liposarcoma
Golden Retriever	Osteosarcoma, hemangiosarcoma
Beagle	Transitional cell carcinoma

Please note that this does not represent a totally complete index.

Also note that mixed breed dogs, generally speaking, have much lower cancer rates than purebred dogs.

## Keeping Female Dogs Intact

Believe it or not, keeping your female dog's reproductive organs intact can increase the risk for breast cancer initiation later in life. So while spaying is promoted to help solve the pet overpopulation problem, spaying female dogs before their first heat also almost totally eliminates the risk of cancer of the mammary gland (breast cancer)! The older the dog is at time of spay, the less protection is gained from the surgery.

The first heat, on average, arrives at 6 months of age. Dogs usually cycle every 6 months thereafter (one heat every 6 months) until late in life.

Mammary cancer is the second most frequent canine cancer in this country.

This means that the second most common form of canine cancer can be eliminated by spaying female dogs before 6 months of age.

### Time of Spay and Odds of Female Dogs Getting Mammary Cancer:

<u>Spay Date</u>	<u>% of Dogs That Get Mammary Cancer</u>
Before 1st heat	0.05%
Between 1st and 2nd heat	8.0%
Between 2nd and 4th heat	26%

No benefit in reduction of mammary cancer was found in dogs spayed after their fourth heat.

Since the spaying procedure removes the ovaries and the uterus, the surgery also eliminates the risks of ovarian and uterine cancer in female dogs.

If one is looking at mammary, ovarian, and uterine cancer prevention alone, spaying before the first heat is a must—right?

Not quite. There is evidence that shows that spaying and neutering—while decreasing mammary cancer rates and keeping the pet population down—actually puts dogs at an increased risk for other kinds of cancer.

## Spaying and Neutering

There is new evidence that fixed purebreds are actually at increased risk for bone cancer (osteosarcoma) at twice the normal rate, and the risk is even higher for Rottweilers.

One study concluded that gonadectomy (either spaying or neutering) may not uniformly protect against all cancers. A study of Rottweiler dogs showed that male and female Rottweilers that underwent gonadectomy before one year of age had an approximate 1 in 4 lifetime risk for osteosarcoma and were significantly more likely to develop osteosarcoma than dogs that were sexually intact.

Both sexes, especially Rottweilers, will have an increased risk for bone cancer if they are spayed before one year of age.

But fixing dogs doesn't just increase the risk for osteosarcoma. Castration increases the most common type of bladder cancer (transitional cell carcinoma) by *four times*. Early surgical sterilization also increases the risk of prostate cancers and hemangiosarcoma.

When we decide to spay and neuter our dogs, we trade one benefit—reducing the chances of mammary cancer to almost nothing—for a risk—increasing the chances of bone cancer and others.

Generally speaking, most mammary cancers are not as aggressive as most bone cancers, so this is an important risk/benefit to weigh if you are considering spaying or neutering your dog.

Most vets do not talk about these risks with their patients, whether because they simply do not know about the risks, because they enjoy a profit from the procedure, or because they accept the current dogma on sterilization.

There is a widespread belief among vets and pet lovers alike that sterilization is good, and keeping our pets intact is not good.

The benefits of sterilization *do* include eliminating unwanted pregnancies, uterine infections, and sometimes, in some dogs, undesirable behaviors, but the increased cancer risks are serious and I want to make sure you know about them. You must consider your own priorities when deciding whether to spay or neuter your puppy.

If you elect to fix your dog, I suggest that in order to gain the health benefits and avoid many of the cancer risks, wait until he is 18 to 24 months old, or she is between the 3<sup>rd</sup> and 4<sup>th</sup> heat.

If you wait until then, your dog gets the benefit of the naturally-occurring sex hormones during her crucial developing years, and you lower his risk for developing the cancers named above. Meanwhile, you lessen the chance of your female dog getting mammary cancer, and most of your dog's life is spent offspring-free.

You should weigh the benefits and risks for your particular dog and, of course, talk about all of this with your veterinarian as you make your decision.

Let's move on to another potential risk factor for your dog: sunlight.

## Sunlight Exposure

Two main types of cancer are seen more often in dogs exposed to a lot of sunlight. These cancer types are hemangiosarcomas and squamous cell carcinomas.

Weirdly enough, melanomas in dogs are not linked to sunlight exposure, as they are in humans.

The sun is a source of radiation. Radiation is just another name for energy as it passes through space or material objects. But certain kinds of radiation are able to actually increase the chances of some kinds of cancer in dogs, because the radiation causes mutations in the cell's DNA.

The cancer I see most commonly in my practice is hemangiosarcoma of the skin, and I usually see this in dogs that are genetically prone to it.

In my opinion, it is rare for sun exposure to actually cause cancers in dogs, but I do believe it can tip the scale to cancer development in dogs that also have other risk factors.

Some vets recommend putting sunscreen on dogs. There is a debate in the human scientific literature about the net benefit of sunscreen, with evidence both for and against its use.

In my opinion, if you have a dog with a type of tumor that is linked to sun exposure, then sunscreen and/or sun avoidance can't hurt.

Your dog may or may not enjoy sunscreen applications. To catch her when she's most compliant, apply it just before a meal, a walk, or some other activity she enjoys. Also, be sure to keep sunscreen away from his eyes and out of his nostrils.

## Viruses

Cancers caused by viruses are rare but worth mentioning. Viruses in general are known to cause growths in the body, and then those growths are contagious to other dogs.

One benign growth is the papilloma, which is a small, fleshy, wart-like growth that can develop on the skin of young dogs. They are not a real health problem; more of a cosmetic issue. Very rarely they will happen in the mouth, and this can look and feel uncomfortable.

Transmissible venereal tumors are actually spread by a virus during mating, and can be problematic because they interfere with normal life. They are benign, but sometimes present themselves as massive, proliferating growths in unpleasant areas.

These tumors can interfere with fertility by blocking the vaginal tract or growing on the penis, which may prevent mating altogether. Depending on their position, they can get scraped up or chewed on, which can lead to bleeding or infection. However, in my experience, they are quite uncommon, and very rarely cancerous.

## Important Points to Remember

- Cancer-causing chemicals called carcinogens are found in food, air, and water.

- Free radicals within the body and from outside sources can start cancer during the process of DNA oxidation. Antioxidants interrupt this process.
- Inflammation is a central process in cancer development.
- Not spaying female dogs significantly increases the chance of breast, ovarian, and uterine cancer. Spaying before six months of age significantly decreases the risk of mammary cancer, and totally eliminates the risk of uterine and ovarian cancer.
- However, spayed and neutered dogs, especially Rottweilers, face increased risk for osteosarcoma, hemangiosarcoma, transitional cell carcinoma, and prostate cancer.
- Sunlight and radiation from the sun can cause occasional DNA mutations, putting a dog at risk for cancer especially if there are other risk factors present.

## Chapter Seven: The Body's Natural Cancer-Fighting Ability— The Immune System

*"Look deep into nature, and then  
you will understand everything  
better."*

*--Albert Einstein*

Many times, when we scientists are searching for the cause of a health problem, we tend to look at the very small details in search of the one hidden, secret, "key."

This kind of thinking shows up in many ways, including one we've already talked about: how clinical studies isolate compounds and study them in a vacuum.

The problem with this mindset is that sometimes we end up missing something important: the big picture. We're so focused on the details—for instance, how one carcinogen affects the body—that we miss the bigger picture—the fact that a substance can combine with another to have a synergistic outcome and a completely different effect on the body.

When it comes to health, I often turn to nature to provide me with that big picture perspective. I ask, “How does the body maintain health?”

This crucial question can reveal a world of answers that could never be discovered by delving into isolated chemical compounds in test tubes.

Some of us are living unhealthy lives, but many of us do not understand just how unhealthy.

I’m not just talking about stress, or diet, or exercise, although they’re all included. I’m talking about some more basic ideas.

For instance, every morning the sun rises, and every evening it sets. When it is dark outside, I feel sleepier than I do when it is light. This simple observation leads me to believe I should sleep when it’s dark and wake with the light.

But think about how rarely we do that these days. With artificial light, television programming, computers, unlimited long distance plans, and all the others benefits of civilized life that allow us to “stay active” 24 hours a day, it is entirely possible to go to sleep long after the sun sets, and wake up long after the sun rises...even though it might be better to do the opposite.

Why am I talking about this in a book about dog cancer?

Because our dogs have amazing bodies that can fight off cancer naturally, but our lifestyle choices prevent them from doing that as well as they might.<sup>2</sup>

Nature really does know best. I believe that we should follow Einstein’s advice and look to nature for ways to combat cancer.

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<sup>2</sup> I am not going to address human cancer in this book, because we are focusing on our beautiful dogs and their health. That said, I hope this book inspires all of us to take good care of our own lifestyles and health.

Everyone has heard—whether from their mother or their doctor or some other caretaking figure—that we should eat right, get a good night’s sleep, relax, and get some exercise.

Our dogs need these same things, because these things result in a better, healthier life in a stronger, more capable body. These things also lead to a stronger immune system, which makes for a stronger anti-cancer response in the body.

We know that after a cancer starts to grow, the body’s immune system is supposed to notice the problem, move in, and clean up.

The immune system attacks cancers by using two specialized kinds of white blood cells. They are called natural killer (NK) cells and cytotoxic T cells. These cells patrol the body, identifying cancer cells and then destroying them. You’re going to learn a lot about these cells in this chapter.

Sometimes, though, the immune and body repair systems can’t do their jobs because they are malfunctioning. When this kind of dysfunction occurs, the white blood cells can even attack other, healthy cells that are actually supposed to be there.

There are a lot of reasons your dog’s immune system might be dysfunctional, and many of them are the result of an unhealthy lifestyle.

You see, in order to be useful, the immune system needs to be controlled. A lot of this control is pre-programmed within our bodies, but it is also affected by our daily habits and the things we eat. The immune system can get tuned up and tuned down.

If the immune system is tuned up, immune stimulation prepares the body to fight potential problems. Tuning the immune system down to the point where it stops protecting the body is called immune suppression. When the immune system is too suppressed, cancers can form. Here are some causes of a suppressed immune system:

- Excessive omega-6 fatty acids in the diet
- Deficiency of antioxidants
- Overfeeding
- Unnatural sleep/wake cycles

- Vaccinosis
- Stress and depression

Let's go over each of these immune suppressors in detail. As we discuss, you're going to learn a lot about your dog's amazing immune system—and your own!

## Excessive Omega-6 Fatty Acids

One way the immune system regulates its balance is through the different types of fatty acids in your dog's diet.

Fatty acids—the building blocks of dietary fats and oils—are not really acids in the way the word is commonly used. They are useful molecules that are stored in the body and used as energy later on. The main types we will be looking at are called omega-6 fatty acids and omega-3 fatty acids.

Omega-6 fatty acids are found in vegetable oil and grain. In turn, they are also found in the fat of grain-fed animals. If your dog eats meat from those grain-fed animals, he or she is also eating omega-6 fatty acids.

When taken in excess, omega-6 fatty acids can cause immune suppression and the body becomes more susceptible to illness.

On the other hand, high levels of omega-3 are found in krill, which are the small shrimp-like plankton eaten by whales. Omega-3 is also found in cold water fish such as sardines, mackerel and menhaden. Flax seed has omega-3 in it, as do some kinds of algae.

The powerful omega-3 fatty acids actually serve to block the immune suppression effects of omega-6 fatty acids, helping the immune system to function normally.

Neither humans nor dogs are eating enough of the omega-3 fatty acids in the modern diet. In recent years, with the increase in grain-feeding our livestock, dogs and humans are consuming too much omega-6—more than ever before.

Without enough omega-3 in the diet to block the effect of too much omega-6, the risk of cancer will increase.

When you look at commercial dog food ingredient labels, the first on the list are the main ingredients. Those ingredients are usually omega-6 laden corn, corn meal, wheat, flour, and other such components.

These are used in dog food because grain-based foods are cheaper to make than those made from meat. Other fats like corn oil, vegetable oil, and beef tallow are also added as top ingredients. These too are rich in immunity-suppressing omega-6 fatty acids.

The link between cancer and omega-6 has been known in animals for some time, but we didn't hear much about it. Now that the same discoveries are being made in human research labs, there is more press coverage.

Dr. Millie Hughes-Fulford, director of the Laboratory of Cell Growth at the San Francisco VA Medical Center, found that "the omega-6 [fatty acid] was turning on a dozen inflammatory genes that are known to be important in cancer. We then asked what was turning on those genes, and found that omega-6 fatty acids actually turn on a signal pathway called PI3-kinase that is known to be a key player in cancer."

That sounded pretty technical, but basically what the lab found was that certain genes that are important in the development of cancer are being turned on by omega-6 fatty acids. In other words, the omega-6 acts as a "key" that unlocks those cancer-promoting genes.

It must be obvious by now that reducing the amount of omega-6 fatty acids in your dog's diet—and increasing the amount of omega-3 fatty acids—is a crucial step to boosting his immune response.

When I discuss the Full Spectrum Cancer Diet in Section IV, I will discuss the best ways to introduce more omega-3 fatty acids into your dog's diet.

But first, let's look some more at antioxidants—a complex topic that demands your deep understanding if you are going to be making decisions about your dog's cancer treatments.

## Antioxidant Deficiency

Antioxidant deficiency in your dog can lead to cancer development. Remember, free radicals and other oxidants (carcinogens) can enter the

body, and if the body's natural antioxidant defenses aren't able to "clean them up," cancer can start.

If you are like most people, you probably think something like this:

Oxidants and Other Free Radicals = Bad for Dog

Antioxidants = Good for Dog

While this makes sense, it's unfortunately not that black and white when it comes to treating cancer.

### Antioxidants—How Much Is Too Much?

Let's look more closely at antioxidants. These substances, which include vitamins A, C, E, and the carotenoids, "clean up" free radicals and oxidants and sweep them out of the body.

And their effect on cancer can be dramatic.

In a recent study, cancer patients who weren't getting enough antioxidants were given supplements at USDA-recommended levels, and the effects were measured. Positive effects included decreased hospital time, fewer infections, and fewer toxic side effects of chemotherapy.

According to a report by the *American Journal of Clinical Nutrition*, "Throughout the 6 month study period, subjects ingested vitamin E, total carotenoid,  $\beta$ -carotene, and vitamin A in amounts that were 66%, 30%, 59%, and 29%, respectively, of the US recommended dietary allowance or of the amounts specified in the third National Health and Nutrition Examination Survey. Greater vitamin C intakes at 6 months were associated with fewer therapy delays, less toxicity, and fewer days spent in the hospital. Greater vitamin E intakes at 3 months were associated with a lower incidence of infection. Greater  $\beta$ -carotene intakes at 6 months were associated with a decreased risk of toxicity."

Notice that the dosages were supplemental doses, not mega-doses. They didn't give these cancer patients, say, 3,000 times the recommended dose of vitamin A, thinking it would combat cancer. Instead, the patients were given just enough to reach the daily allowance.

And that was enough to see some remarkable results in the comfort and health of the cancer patients.

Many people, including many vets, make the mistake of believing that if one dose is good, two would be better—or three, or ten, or twenty. In other words, they believe in mega-doses when it comes to cancer treatment.

But not all antioxidants should be given in mega-doses, because some antioxidants can actually decrease the effectiveness of radiation and some chemotherapy drugs!

The use of antioxidants in cancer therapy has actually been widely debated. Here are the details behind this concern:

Many people know that the presence of excess free radicals in the body can cause cancer.

What they may not know is that radiation, many anticancer drugs, supporting supplements, and other treatments intentionally create free radicals within the cancer cells.

Remember, a free radical is a very sensitive substance that reacts with what it touches and destroys it. The way free radicals commonly destroy things is by oxidation.

When the number of free radicals within the cancer cells increases, the cancer cells die because they are burned up from the inside by the free radical-induced oxidation. This is good news!

But if someone takes large doses of antioxidants to “remove free radicals from the body” because they know that free radicals cause cancer, they may actually remove the very free radicals that are fighting the cancer cells!

You can see how indiscriminately taking large doses of antioxidants can actually counteract and even lessen the effectiveness of cancer therapies.

You’re probably thinking, “If we want to kill cancer cells by creating free radicals to attack them, why would we ever *want* to stop free radicals?”

Well, here is the catch:

There are certain vitamins and supplements that are *called* antioxidants because they have some antioxidant effects in general in the body...but they do not kill cancer cells by being antioxidants.

At higher doses, some of the so-called “antioxidants” actually have “*pro-oxidant effects*” on cancer cells, meaning they literally increase the free

radicals within the cancer cells. These are the kinds of vitamins you want to give a dog with cancer.

It is a mistake to generalize and say that high doses of any and all antioxidants are good for cancer treatment, because only certain antioxidants at certain doses are good for such purposes.

Later, I'm going to go over which antioxidants are crucial to cancer care. For now, keep in mind that it is sensible to supplement your dog's diet with maintenance antioxidants (low daily amounts in the diet) for overall health. The interference with radiation and chemotherapy is minor, and these vitamins do make the body feel better.

However, free-for-all supplementing of anything called an "antioxidant" is not sensible. The Full Spectrum Cancer Care section helps you make rational choices about specific antioxidants that can really help your dog.

Of course, I also recommend you get input from your vet and any other professionals involved in your dog's health care.

## Supplementing With Vitamin Tablets

There is an important but often overlooked concept in medicine called biochemical individuality.

This means that while every body needs a certain baseline amount of vitamins and minerals, some people need much higher levels of certain vitamins and minerals than other people do.

In other words, every body is different, and studies show that every body requires different levels of maintenance vitamins and minerals.

I am convinced the same principle exists in dogs. We need to make sure that the daily recommended amount of vitamins is given to avoid deficiencies. These levels are safe and can help promote better health.

The best way to provide vitamins in their natural form is to feed your dog vitamin-rich foods. When this is not possible, supplemental tablets and capsules are second best.

In order to gauge vitamin tablets' efficacy, we need to look at three things: the amount, the form, and the medical benefit.

Regarding amount, be careful and do your research. Many products have levels that are simply too low to be effective. Check out Consumer Lab ([www.consumerlab.com](http://www.consumerlab.com)), which puts out information on supplement analysis.

Secondly, the form of the antioxidant makes a difference. For example, in 2004, the USDA found that *synthetic* vitamin E supplements (D,L alpha tocopherol) have half the activity as the *natural* supplement (D alpha tocopherol). Use natural supplements if you can.

Lastly, the absorption of a supplement is affected by what else is ingested with that supplement. This is crucial.

Some vitamins (D, E, A, and K) are fat-soluble, which means they need the presence of dietary fat in order to be absorbed into the blood stream. This is because, in the wild these, vitamins are found in the fat of prey.

If you were to simply give a vitamin E capsule to a dog, without also giving a fat or oil, the vitamins might pass directly into the feces unabsorbed. Giving supplements along with substances in which they are naturally found helps move them through the body so they can have a healing effect.

If you are giving your dog a multivitamin, it should always be given with food. There should also be some fat in the meal to allow the fat-soluble vitamins to be absorbed. An excellent choice is virgin coconut oil or coconut milk. I will discuss this more in the diet chapter of the Full Spectrum Cancer Care section.

### Where Are Antioxidants Found Naturally?

Vitamins A, C and E are antioxidants. So are lutein, lycopene, and the carotenoids.

Vitamin A can be found in liver, carrots, milk, eggs yolk, and sweet potatoes.

Vitamin C is found in red meat, fish, poultry, and many fruits and vegetables.

Vitamin E is found in nuts, broccoli, and oils from corn and soy.

Lutein is found in leafy greens like spinach and kale.

Lycopene naturally occurs in red, pink, and orange foods like tomatoes, watermelon, grapefruit, apricots, and papayas.

Carotenoids are found in colored fruits and vegetables like green and yellow peppers, squash, spinach, kale, and carrots.

The body also produces enzymes that increase antioxidant levels. These enzymes need a mineral called selenium in order to function properly. Selenium is found in produce and meat, and the amount any food contains is determined by the selenium content of the soil where the food was farmed.

It is important that your dog gets enough of these antioxidants, and I'll go over dosing in detail in the Full Spectrum Cancer Care section.

Right now you may be thinking, "Don't dogs in the wild eat meat? How are they getting all these vitamins that aren't actually found in meat?"

Here's how they do it: dogs hunt animals that feed on plants and grasses, which are naturally full of these vitamins. Also, when dogs and their wild cousins—wolves and coyotes—take down a prey, they first eat the stomach. That's right—they first go for the fruits and veggies in their prey's belly! The flesh and bones are a second helping.

Dogs instinctively crave plant matter, because their bodies require the vitamins and minerals those plants provide. This is why so many dogs will eat grass or leaves.

Am I saying that we should start feeding our dogs a bunch of nuts and grapefruits? Definitely not.

However, it is important to formulate a diet plan including foods that not only contain healthy levels of antioxidants, but also can be eaten and absorbed naturally.

We should also provide the necessary supplements and make sure they are absorbed properly. As pet owners, it is our responsibility to ensure that our dogs are eating the best foods possible.

We will go into details about antioxidants and vegetable feeding in the Full Spectrum Cancer Care section. Next, I want to talk about a rather touchy subject for many dog lovers.

## Overfeeding

I know it can be tempting to feed table scraps to our dogs, or to give them extra food as a special treat. The problem is that sometimes we're feeding them too much without realizing it.

Overfeeding can lead to obesity, and obesity definitely contributes to cancer. This has been widely documented.

A study was done on 48 Labrador Retrievers from 4 different litters. Half of the dogs were fed a lot of food—as much as they could eat, with no restriction—and the other half were fed 25% less food.

The lifespan of the dogs on the restricted diet was significantly longer than the ones who ate a great deal. The incidence of cancer was about the same, but the dogs in the restricted group lived an average of 2 years longer than the excessively-fed dogs.

The precise link between excess body fat and cancer is not yet completely defined, but new research has shown that fat cells secrete a chemical called adiponectin, which actually lessens the development of cancer cells.

Fat cells secrete actually much *less* adiponectin when the body has excess fat in storage, which happens in a heavy animal.

Fat cells secrete *more* adiponectin when the fat cells are being burned for fuel, which happens in a leaner animal.

This means that a lean body has more adiponectin than an obese body, and so a lean body is more able to resist cancer.

It may be obvious by now that the quality of your dog's food and the amount of that food can really contribute to a healthy immune system—or contribute to its suppression.

But have you ever thought about your dog's sleeping habits, and how they might contribute to cancer? Let's go there now.

## Unnatural Sleep-Wake Cycles

*“Sleep is the best meditation.”*

*--The Dalai Lama*

Sleep is pretty underrated these days. We don't get enough of it, and when we do, it's often at random intervals. But sleep has real-life, major health-giving benefits. Here is why:

### Melatonin

As it turns out, cancer-fighting activities happen in the body during sleep. In deep sleep, the brain's pineal gland releases a hormone called melatonin. Melatonin helps deepen our sleep, and it is a vital, natural part of the body's cancer-fighting system.

The amount of melatonin in the body goes up and down daily, and its release is dependent upon darkness. When we are up late, and the lights are on, the amount of melatonin secreted by the pineal gland goes down.

If we turn out the lights and go to bed early, the pineal gland will secrete more melatonin and it will help our body all the more.

So how does melatonin work?

When cancer cells divide, a switch within them must be flipped in order to start a complicated chemical reaction that leads to cancer cell growth.

One step in this chemical reaction requires a substance called linoleic acid, which locks on to the outside of the cancer cell and is then shipped inside. When the tumor takes in the linoleic acid, the switch is flipped.

Obviously, it is important to block linoleic acid from locking onto the outside of the cancer cell. That's where melatonin comes in.

If melatonin is present, it actually hitches onto the cancer cell first. This means that when linoleic acid arrives to flip the switch, it can't get in. Cancer growth cannot turn on and the cancer cells cannot divide.

To fight a developing cancer, the body needs darkness at night, and a lot of it. In general, the body needs more darkness than it is currently getting.

The fact that we are awake at night, with the lights on, is one reason why our dogs are unable to clear developing cancers.

There is a massive, excellent bank of quality information about melatonin and cancer. It is a shame that more attention has not been directed towards it.

Dr J. White and Dr. W. Smith at the National Cancer Institute said, “Both melatonin and chronotherapy (timed cancer treatments) have been studied for many years but, despite largely positive findings, have not been brought into mainstream cancer therapy.”

According to the *Journal of the National Cancer Institute*, breast cancer was more commonly found in women who were up and about at 1:30 AM, which is when melatonin should be at its highest levels.

The journal *Neuroendocrinology Letters* published a report that confirmed low melatonin levels in women with breast and uterine cancer, as well as in men with prostate cancer.

Correcting a melatonin deficiency in cancer patients has many benefits. It prevents cancer cachexia (cancer-related weight loss), lowers metastasis (cancer spread), helps patients sleep better, lessens side effects of chemotherapy and radiation, and makes for longer life expectancies. This was confirmed in the speaker series “Melatonin, Chronobiology, and Cancer.”

Our dogs generally sleep when we sleep. This means that by taking care of ourselves and sleeping at the right times—and for enough time—we will not only help ourselves, but will also help our dogs with cancer.

Hopefully I’ve convinced you to go to bed on time tonight. In the meantime, let’s look at another hot topic: vaccination.

## Vaccinosis: Can Vaccines Cause Cancer?

Sometimes vaccines, which are given to help the body fight off a disease, can lead to other problems for the body. This group of problems, or diseases, is generally called vaccinosis.

The immune system is very sophisticated and has many moving parts that work with the other systems in the body. Sometimes (rarely) a vaccine can trigger an undesirable reaction that results in an immune disease, like

immune-mediated hemolytic anemia or immune-mediated thrombocytopenia, both of which actually use the immune system to attack normal body parts like blood cells. Other possibilities include immune-mediated arthritis, some forms of thyroid dysfunction...and cancer.

I've given lots and lots of vaccines to lots and lots of dogs. When I first heard the word vaccinosis, I thought it sounded made up; a word created to vilify vets who vaccinate dogs. I thought that the word was intended to sound like a disease; a word coined by people who had an emotional need to be anti-establishment.

On top of this, I felt that anyone who claimed vaccines could be linked to cancer was full of garbage. I was sure that if I thoroughly reviewed medical literature, I would find no such evidence. The idea that vaccinations might increase a dog's cancer risk seemed like a complete fabrication to me.

Have you ever heard the expression, "condemnation before investigation?" Well, that described me to a tee.

It actually turns out that vaccinations *can* be linked to cancer development.

To really understand how a vaccination could cause cancer, we have to start with understanding the immune system a little bit better.

The immune system can be divided into two parts: cells that attack and kill foreign invaders and other bad things, and cells that make antibodies.

## Natural Killer (NK) and Cytotoxic T Cells

Natural killer (NK) and cytotoxic T cells have one job: destroy anything that is not supposed to be in the body. They actually patrol the body for cancer, microbes, and viruses. When they find a problem with a cell, they destroy it.

They show no mercy.

This action is called cell-mediated immunity. When the immune system is tuned up, newly formed white blood cells turn into natural killer and cytotoxic T cells.

## Antibody Producing Cells and TH2 Cells

Other kinds of immune system cells make what we call antibodies.

Antibodies are specialized molecules that flow around in the circulation and attach to bodily invaders such as bacteria, viruses, and fungi. Once an antibody has attached to an invader, the immune system knows it is a target for destruction.

This part of the immune system is called humoral immunity, and it is very important for fighting off problems in the body. The TH2 cells, which stimulate the cells that make antibodies, are a big part of humoral immunity.

You are probably very familiar with this kind of immune system response, because it is the reason for giving vaccinations. A vaccination injects a small amount of an active or inactive foreign substance into the body so that the immune system will create antibodies for it. When the immune system creates those antibodies, it also creates a “memory” of the invader. If the invader shows up again, the immune system can “remember” what worked the last time to rid the body of the invader.

This is why, for example, an infant can get a vaccination against measles and avoid getting measles later in life, even if they are exposed. The vaccination stimulates the immune system to develop antibodies for the measles. Later when measles shows up again, the immune system “remembers” it and mobilizes to defend the body.

When everything works perfectly with the immune response, it is very unlikely that the disease will develop in the future. But some vaccinations fail in some cases, and no vaccination provides 100% protection. In fact, some vaccines are even advertised as providing only partial protection, like the flu vaccine for humans.

### The Vaccination Debate

Sounds like the body has a lot of natural defenses, right? Way to go, immune system! And vaccinations help to boost the humoral immunity defense system, so they must be good, right?

Well, not entirely.

This is the cause of much debate in both human and canine medicine. Here's what happens on the human side:

When a human baby is vaccinated against a particular disease (measles, mumps, etc.), the body is stimulated to make a lot of TH2 cells—the cells that fight off those viruses. Antibody levels rise and protect the body against that particular disease.

But the TH2 cell stimulation from early vaccination seems to limit the body's normal production of cytotoxic T cells and natural killer cells, at least in human infants.

Vaccination may have an unrecognized risk: seriously limiting cancer patrol.

How does this happen?

We are unwittingly making a trade, letting our children's bodies shift towards immunity to vaccinated diseases and away from cancer fighting.

This may be one of the reasons cancer rates have gone up in the last few decades, as vaccines have been administered more often to newborns.

In a vaccination study done on mice, the shift away from cell-mediated immunity (the work performed by the body's cancer patrollers) was also found persisting later into adulthood.

We dog owners should consider a few things here.

First, there has been no study comparing cancer rates between vaccinated and unvaccinated dogs. No study has proved that vaccinated dogs are more prone cancer. I do not mean to say that dogs are different from humans in this respect. I just want to be clear that we do not have positive proof that it is true.

Secondly, it's not a good policy to simply, automatically apply the information in these studies to dogs. This is because we don't have a single good age for a dog "infant" to parallel the human infants in the studies. Dogs go through a puppy stage which is similar to human childhood, but it's hard to make a true comparison.

Lastly, this information does not mean that all vaccines are bad. We should recall that as recently as a few decades ago, there were very serious

diseases that have almost disappeared due to vaccinations. So it's not fair to call all vaccines detrimental. However, there truly may be a strong link here between early vaccinations and cancer, which is worth further research.

So what do we dog owners do with this information? Like everything in veterinary medicine, there is always a risk versus a benefit. Here are my thoughts on the matter:

We should avoid vaccinating our dogs unnecessarily. For instance, I do not administer rabies vaccinations to my patients, because rabies does not exist in Hawaii.

Next, when vaccinating, we need to make doubly sure we do not over-vaccinate our dogs. Start your puppy's first vaccine series later, if it's possible—around 10 weeks of age instead of 6 weeks. This will allow your puppy's cancer-patrolling cells to mature a bit more before the vaccination, possibly preserving their functions.

After your puppy's first year, vaccine protection against the most common illnesses will last at least three years.

I also recommend you do not vaccinate against everything simply for the sake of it. Try to only vaccinate against things that are found in your area. Your vet should have some insight into which illnesses these are.

If you have already vaccinated your dog and are feeling bad that you may have somehow “caused” their cancer, I want to remind you that beating yourself up is totally counterproductive and not the in the job description of your dog's Primary Health Advocate.

Please be gentle with yourself. I know how hard that can be, but it's especially important in the next section, where we will go into a little detail about something that really suppresses the immune system—stress and depression.

It might be nice to take a break for a little while and hug your dog, and then come back to read this part of the book.

## Stress and Depression

There may be stress and depression in your dog, of which you may have been unaware.

Unfortunately, stress and depression are strongly linked to the development of disease, including cancer.

Because we are humans, not dogs, we are unable to understand many parts of our dogs' psyches. Dogs experience the world differently than we do, so we can't possibly know everything about how they think and feel.

Truthfully, the link between stress and illness in veterinary medicine is largely ignored. I was unable to find data linking stress and depression to cancer in dogs.

However, there is a lot of information in human literature that we can look at for insight. As a matter of fact, there is an entire field which looks at the human link between psychological state, illness, and immunity. The field is called psychoneuroimmunology.

So while I admit that what I am about to say has not been scientifically proven to directly apply to dogs, I believe from my own experience as a vet and a dog lover that it can and does apply to our dogs. And I think it is important enough to include in this book, despite the lack of clinical proof.

## Psychoneuroimmunology

In human medicine, there is a clear link between chronic stress, depression and sickness. It turns out that the body releases certain hormones and chemical signals when the mind experiences stress and depression, and others chemicals when it experiences relaxation and happiness.

The stress chemicals include epinephrine and cortisol, which are made mostly in the adrenal gland, which is a small organ next to the kidneys, and norepinephrine, which is made at nerve endings.

When humans experience stress, the body releases epinephrine, norepinephrine, and cortisol in brief, high levels. These help the body in the short term by helping raise blood sugar, opening the lungs, making the heart beat faster and stronger, sending blood to major muscles, and more. This helps the body run fast and get away from harm, or stay strong during a fight. You may have heard the term "fight or flight" to indicate a state of high stress, during which the body gears up for either attacking or running away.

In nature, dogs also experience short periods of stress. Usually these quick bursts happen when dogs fight or run from an attacker or a predator.

The problem is that these natural hormones are harmful if they are released for long periods; if people or dogs are chronically stressed. In fact, these hormones reduce the number of cancer-fighting immune system cells.

A medical journal called *The Lancet Oncology* reported, "...In general, both stressors and depression are associated with the decreased cytotoxic T-cell and natural-killer cell activities that affect processes such as immune surveillance of tumours, and with the events that modulate development and accumulation of somatic mutations and genomic instability [DNA mutations]."

This means that the very cells involved in cancer patrol—the NK cells and cytotoxic T cells—are suppressed in the presence of stress hormones. If the cells involved in cancer patrol are less active, developing cancer cells are not caught and cancer can progress.

## Stress Hormones Stop Natural Cell Death

Normally, most body cells have a lifespan. At some point, liver cells, heart cells, kidney cells, etc., are genetically programmed to die. Many times this is to make way for new cells. You may remember that this process of programmed, healthy cell death is called apoptosis, and is completely natural and normal.

A cell protein named Bcl-XL/Bcl-2-associated death promoter usually starts the process of apoptosis. This protein's nickname is an acronym, and it's "BAD," which is kind of a pun for molecular biologists.

The BAD protein causes cell death. At least, in most cells.

Cancer cells do not go through apoptosis. Their growth is continual. They try to be immortal at the expense of the body. They have totally taken over, and they eliminate apoptosis altogether (we'll talk more about how later).

According to the *Journal of Biological Chemistry*, one of the reasons for immortality of cancer cells may be the body's excessive levels of the stress-related hormone epinephrine. Epinephrine actually causes cancer cells to shut down the BAD protein, which then allows the cancer cells to live forever.

I'm sure by now it's obvious that we need to reduce stress hormones as much as possible. We don't want to interfere with BAD, because it can shut down cancer cells.

But it's not just the fight or flight response that raises stress hormones.

Low self-esteem does the same thing.

## Low Self-Esteem Increases Cancer Risks

The effects of epinephrine and norepinephrine were also studied in children with cancer, as reported in *Research in Nursing & Health*.

The study found that epinephrine was high in kids with lower self-worth, and high norepinephrine levels were found in children with less social support from friends. Higher stress hormones mean a weakened immune response, which means more room for cancer to flourish unabated.

This is a direct link between psychology, hormones and their effect on cancer development.

In my opinion, this is a big deal. I believe we can take this information and apply it to our canine cancer patients.

Do dogs have self-worth? You bet they do.

How about needing social support, from either owners or other dogs? Yes, they need these as well.

Dogs, as you may know, are pack animals. In nature, their self worth and social support comes from their position in the pack. In our homes, their self worth and social support comes from relationships with people or other pets.

As self worth and social support increases, the stress hormones should drop. Later on in the Full Spectrum Cancer Care section, we will look at ways you can increase self worth and social support.

Maybe even more importantly, we will be doing everything we can to increase happiness and life quality. More than anything, that is what this book is all about.

I recommend that you start paying closer attention to your dog. Does she perk up when you come home? Tune into her with your feelings. Does he miss you, or wish you played more? Do you feel a sense of insecurity, or sadness, or heaviness?

If you notice any of these things, remember that they are not helping your dog's cancer treatments. I have lots of suggestions for boosting self-

esteem in the Full Spectrum Cancer Care section later on, and the exercises from Chapter Three will also help.

## Shaking It All Off—Getting Ready to Learn About Cancer Treatments

This concludes the major section on cancer causes, risks, and triggers. I know it was a lot to take in, and I hope you don't feel too worked over.

I want to congratulate you on doing such a great job at helping your dog. The more you know about what causes cancer, the more you can help your dog.

You're about to start learning more about what helps fight cancer, too.

If you saw any of your own past actions in this section, I hope you have kept in mind my advice to go easy on yourself. Over the years, I have dramatically changed the way I care for my dog and my patients, as a result of learning this information I've just shared. I remember feeling startled and sometimes guilty when I realized that I was maybe not helping my dog, who I love so much.

But just like a dog shakes water off his coat, you must shake off any guilty feelings. Remember, a Primary Health Advocate is top dog, and has mastery over negative emotions.

The past is past, and the future isn't here yet. Focus on helping your dog from where you are now. Take whatever insights you gain and any steps you find valuable and use them to help your dog!

In the next chapter we'll learn about the common approaches to cancer treatments, in preparation for learning "the good stuff" I've promised all along...actual cancer treatments.

Turn the page now to get started.

## Important Points to Remember

- Problems in the immune system are a big reason for cancer development. There are many things that harm the immune system, but also many ways to boost it.

- Foods with high levels of omega-6, such as grains and fats, should be replaced in our dogs' diets with foods or supplements rich in omega-3.
- Maintenance daily requirement levels of vitamins should be given to dogs with cancer. If bodily levels of antioxidants are too low, it can cause cancer promotion. But giving a high dose of a vitamin simply because it is an "antioxidant" is a misdirected strategy—it can actually interfere with cancer cell destruction.
- Some things that are called "antioxidants" can be given in high levels to help destroy cancer cells by acting as pro-oxidants. These substances kill cancer cells in ways that have nothing to do with their antioxidant effects.
- Overfeeding our pets leads to obesity, which is a big cancer promoter.
- During deep sleep, in total darkness, the body makes melatonin. Melatonin is a natural anti-cancer hormone. Without it, cancer is promoted.
- There is now evidence that early vaccination may shift the immune system away from cancer patrolling within the body. This could be a cancer-promoting effect.
- Stress and depression are difficult to pick up in dogs, but these are strong cancer promoters, too, due to their effect on the immune system and cancer cells. This is a new perspective on dog cancer treatment and should be addressed.
- Since humans use animal studies to get information about our own bodies, it is logical that most—but not all—information from human studies can be applied to dogs.

## Chapter Eight: It's Not All Black and White— Approaches to Medical Care

We've just gone over a lot of cancer facts and figures, and some pretty detailed information about how your dog's body works.

In the next section of the book, coming up in a few pages, I'm going to go over the major cancers found in dogs and discuss conventional treatments and their success rates.

For now, we're going to look at three common schools of medical treatments.

This may surprise you, but the vast majority of this book contains information that I learned after I left veterinary school. It's unfortunate, but true.

I'll go even further to indict my own profession: the current reality as I see it is that conventional medicine is doing a mediocre job of curing cancer.

Part of the problem, as we've seen, is that cancer is a pretty tough enemy. It fights dirty.

And part of the problem, as I've also already touched upon, is not about cancer at all. It's about us. Some of us—doctors and patients, veterinarians and dog lovers alike—get our priorities conflicted when faced with cancer.

You may be thinking, "What other priority could we possibly have, other than to cure cancer?" Let me explain.

Many people are more concerned with the "how" of medical approaches than with the results. For various reasons, the American view of medicine is

split up into groups these days, and it can be difficult for those in one group to “believe in” or use techniques from other groups, even when those treatments have proved effective.

When we are so closed-minded that we refuse techniques or strategies that have been shown to work, we definitely have our priorities messed up.

Here are some examples of the major categories in Western medicine.

**Allopathic:** This is the term for conventional, Western medicine. Most vets practice this. Cancer treatments in allopathic medicine include surgery, chemotherapy, radiation, and a little bit of nutrition. Treatment plans are made based on placebo-controlled, double-blind studies. While sometimes this approach gets good results, I don’t think it does so often enough.

**Alternative/Complementary:** This is the term for non-conventional (non-allopathic) medicine. Cancer treatments in alternative medicine focus on nutrition, supplements, enzymes, homeopathy, acupuncture, the mind-body connection, touch, and so on. Because there is less focus on double-blind studies, there is less proof that this approach gets good results. But alternative practitioners tend to not worry about that, and upon investigation, I sometimes find myself quite impressed with their results.

**Holistic:** This term has many meanings, which seem to change depending on the speaker. Some use this word to describe medicine that includes both allopathic and alternative/complementary treatments. In the traditional meaning, “holistic” medicine focuses on the body as a whole and concentrates on restoring deficiencies in the body, instead of attacking diseases directly. More and more, though, this word is being used to describe strictly non-allopathic treatments.

Unlike many vets, I don’t fall exclusively into any one of these camps. As a vet and a scientist, I believe it is a huge mistake to automatically exclude techniques and treatments that could be incredibly beneficial, no matter what type of medicine they come from.

That’s why I call my approach to cancer Full Spectrum Care. I will go over this whole approach in detail in Section IV.

I use the term “Full Spectrum” to describe a treatment plan that includes all branches of medicine. The focus of Full Spectrum Care is effectiveness. It can include allopathic medical approaches, as well as

holistic support of the body and correction of deficiencies. Full Spectrum Care includes even the most off-beat alternative or complementary treatments...as long as there is strong evidence to suggest those treatments will help.

As you consider your dog's cancer treatments, I encourage you to keep your mind open, to avoid missing something that may prove useful.

For those of you who like conventional medicine, you may be surprised to find that something from the alternative world really works for your dog.

And for those of you who think that "Western medicine is just drugs and surgery," I would suggest that sometimes those are indeed very effective in fighting cancer.

I know that in a world of limitless information, it is tempting to ignore whatever sounds odd, or whatever does not fit in with what we already know to be true. But cancer is an aggressive foe, and in order to deal with it we must call upon all of our resources.

In the next section I am going to give you detailed information about the conventional treatments for the major dog cancers, and in the section after that I'm going to give you my personal approach to treating cancer.

But before we move on, I'd like to go over two alternative treatments that I recommend you think about when making your plans.

## Acupuncture

This practice began in China thousands of years ago. Acupuncture makes use of small needles to stimulate certain points on the body. These points lie along "meridians", which are described in Chinese medicine as currents of life energy, also called "chi" or "qi". The needle stimulation is thought to increase the flow of this life energy to certain body parts.

The acupuncture points often correspond to bundles of nerves in the patient's body. Nerves are connected to each other through circuits that pass through the spinal cord.

Acupuncture can be useful for pain management and nausea suppression in some cancer patients.

Humans describe the sensation of receiving acupuncture as tingling, hot, or the area becoming “heavy.” Some animals resist these strange and new sensations, though the treatment is rarely painful when performed by a skilled acupuncturist.

Veterinary acupuncture should only be done by a person who is well-trained and experienced in doing so. In my opinion, acupuncturists whose only experience is in human medicine should not perform acupuncture on dogs.

Acupuncture usually consists of treatments every 2 to 3 days, for a period of several weeks. Be advised, this treatment can make things slightly worse before they get better.

If you would like to pursue acupuncture treatments for your dog, go to the American Holistic Veterinary Medicine Association website [www.holisticvetlist.com](http://www.holisticvetlist.com) and use the advanced search option to select “Acupuncture.”

Another useful link for finding a nearby veterinary acupuncturist is the American Academy of Veterinary Acupuncture: [www.aava.org/](http://www.aava.org/)

## Homeopathy

Like acupuncture, homeopathy can have some benefits in certain cases. It was developed in Germany sometime between the 1700s and the 1800s AD.

Homeopathy involves the “Principle of Similars,” or “like cures like”. This means that if a remedy creates the same symptoms as the illness, it can help cure the disease.

The idea is that the symptoms of a problem are actually the body’s way of dealing with or releasing the problem, and are therefore helpful, not harmful. So, in homeopathy, symptoms are increased on purpose.

It would follow that if the symptoms increase, the effect in overcoming the illness would increase, too.

Homeopathy has been shown to help in some, but not all, cases.

Veterinary homeopathy should be only performed by one who is trained and experienced in it. Like acupuncture, homeopathy sometimes causes a worsening of the situation before improvements are seen.

If you would like to consult with a veterinary homeopath, try the Academy of Veterinary Homeopathy: [www.theavh.org/referral/certifieds.php](http://www.theavh.org/referral/certifieds.php)

If you are in search of a holistic veterinarian, try the American Holistic Veterinary Medicine Association: [www.holisticvetlist.com](http://www.holisticvetlist.com)

Before you make decisions, of course, it is wise to make an assessment of how helpful they might be.

## How Do You Know if a Treatment Works?

As a dog lover dealing with a cancer diagnosis, you should always be on the lookout for evidence of a treatment's effectiveness, preferably in the form of one of the following:

### Evidence From a Placebo-Controlled, Double-Blind Study

A placebo-controlled, double-blind study is the standard in Western science. You may remember that in this kind of study, the participants are split into two treatment groups. One is given a placebo—a fake— which is supposed to have no effect on their condition. The other group is given the treatment being studied.

The study looks at effects from the placebo group and compares it to effects from the treatment being tested. This part is called "placebo-controlled".

"Double-blind" means that neither scientists nor the test group are allowed to know which treatments are placebos and which are actually the thing being tested. This helps avoid bias and assumption.

In general, these studies are excellent ways of getting information.

Another critical piece to these studies is the information they can provide regarding side effects. This is very valuable, important information and should always be considered.

Despite being the Western standard, placebo-controlled, double-blind studies are not world renowned. It may surprise Americans, but in other countries with advanced medicine, this kind of study is not used at all.

## Evidence From Clinical Experience

In Japan, China and other Asian countries, the use of a placebo is considered unethical and inhumane. Their perspective is that if you give a sick patient a placebo instead of something that might cure them, you are doing nothing to help, while allowing the illness to continue.

Instead, doctors in such countries use two groups of test subjects, giving one group the best current treatment and the other group the new treatment. They then compare the results to determine which treatment is better. This seems a logical approach to getting information, and a kinder one at that, since both groups are actually being treated.

Clinical experience or historical use can also be a powerful source of evidence. Many treatments from alternative/complementary and holistic systems can be shown to be effective through clinical evidence.

## Evidence From Historical Use

Common sense tells us that if a treatment has been in use for a long time, it is probably doing something helpful. Otherwise, it would have been abandoned. It is also likely that the benefits outweigh the side effects. A tried and true treatment is definitely a valid one.

Many vets will criticize treatments that are recommended based solely on historical use. They do this because, in some cases, there were never actual studies to prove effectiveness and safety.

The funny thing is this: there are many prescription drugs used here in America that have never been approved by the FDA for use in certain kinds of treatments. Here are some examples of such unapproved prescription drugs:

- Cough and cold preparations with antihistamines, such as Pheniramine maleate and Dexbrompheniramine maleate
- Single-ingredient narcotics such as Codeine Phosphate and Oxycodone
- Sedatives such as Phenobarbital and Chloral hydrate

I regularly use some of these drugs in my practice, as do most allopathic vets. This is excellent proof that a history of use can be a justification for using a treatment, in any branch of medicine, from allopathic to holistic.

In closing this chapter, I'd like to take a moment to address side effects.

In my opinion, every treatment has the possibility of side effects. If an effective treatment is supposedly "free of side effects", it probably has not been implemented for long enough. Eventually you will find at least one side effect, which may or may not be harmful to the patient.

In the next section we're going to get into the nitty-gritty of the major cancers and learn more about how traditional veterinary medicine approaches their treatment.

First we should review a few principles. Read this list to refresh your memory and then turn the page to get started on actual cancer treatments.

## Important Points to Remember

- Medicine has lost focus of what works and instead has been categorized. Some categories are allopathic, alternative/complementary, and holistic.
- Selecting treatments based on categories is a process of closed-mindedness instead of thought.
- Full Spectrum Cancer Care is a phrase I use in this book to describe treatments based simply on what works, while ignoring categories.
- "What works" is based on different kinds of evidence. Evidence can come from studies, clinical experience, history of use, and new research.
- Side effects should always be considered, as they are always possible.

## **Section III: Traditional Treatments For Major Dog Cancers**

# Chapter Nine: Conventional Medicine's Cancer Treatments

This chapter is designed to give you a brief overview of how conventional (allopathic) veterinary medicine views and treats cancer. Let's start at a pretty basic place: the naming of cancers.

## Where Cancers Get Their Names

Most cancers are named for the kind of tissue they come from and the organ or body part where they started.

For example, carcinomas are malignant cancer cells that start in the lining (also called the epithelia) of internal organs.

Sarcomas are malignant cancer cells from the connective tissue that helps hold the body together. For example, "osteo" means bone in Latin. Put that word together with "sarcoma," and you have "osteosarcoma," cancer from connective tissue cells in bone.

Some cancer names don't really fit in with this overall system. An example is melanoma. We commonly use it to mean skin cancer, but technically it is describing a simple growth (which could be benign) in the melanocytes, which are the skin's pigment cells. We should call it malignant melanoma to be fully accurate.

Also, some cancers got their names from the way the cells look under the microscope. One example is the word squamous, in "squamous cell carcinoma." This word does not tell you where the cancer cells started, but it does tell you that the cells look squamous, like the scales of a fish.

## The Big Three Conventional Cancer Treatments

Conventional cancer treatment mainly includes surgery, chemotherapy, and radiation. In the next section on Full Spectrum Cancer Care, I am going to go into a lot of detail about these three options, their risks, and their benefits.

But in order for you to understand the following chapters on the conventional treatment for individual cancers, I will briefly summarize each treatment here.

**Surgery** usually means anesthetizing the patient and cutting out the cancer. Surgery can in some cases completely remove the cancer, leaving no cells behind. Other times, undetected cancer cells may be left in the patient.

**Chemotherapy** is the use of drugs to kill some of the cancer cells. Unfortunately, chemotherapy does not cure cancer in dogs, but it does increase lifespan and/or life quality. In the chapters that follow you will see many different chemotherapy agents mentioned with little explanation as to their effect on the body. That is because I will go over each agent in detail in the later section on Full Spectrum Cancer Care.

**Radiation** is the use of an invisible beam of high energy to kill cancer cells and/or lessen the discomfort of cancers. For dogs, it is usually only available at universities or at large referral clinics, not in smaller vet offices. The usefulness of radiation varies depending on the location of the cancer. If healthy internal organs are in the way of the cancer, the radiation may have a harmful effect on those tissues. If the cancer is on the outside of the body, however, radiation is more likely to be useful.

Now let's move on to an overview of the allopathic viewpoints on causes and conventional treatments of the more common canine cancers. This is the only section of the book where I will advise you it's OK if want to skip over a section or two. You may simply want to find the chapter on your dog's particular cancer and read about its conventional treatments, while ignoring the other cancer descriptions.

As you read, you will see that I go over what the cancer does in the body, what the signs and symptoms are, known causes, known behaviors, and the conventional treatment plan.

I also provide some known statistics based on those treatments, and some advances for the more cutting-edge medical approaches to treating several of these common cancers.

This information should not be considered definitive, for two reasons.

First, every dog is different and every outcome will be different. The facts and figures presented here are estimates only, and are not necessarily true for your dog and your dog's cancer.

Some cancers of a certain kind will be less severe than others, while some are more aggressive. Some have invaded or spread more by the time a diagnosis is made. I have made my best effort to provide you with general guidelines and summaries.

Second, some of the recommendations I present are new, which means we do not have enough data to give exact effects or survival statistics. The statistics I provide are based on treatment with chemotherapy, radiation, and/or surgery. Not every combination of treatments has been studied, but most of the common conventional choices are included here.

Later on in this book I will detail Full Spectrum Cancer Care, my preferred treatment approach, which incorporates conventional treatment protocols with some more modern, off-the-beaten-path techniques.

I firmly believe that your dog's lifespan and life quality will be increased with the use of the Full Spectrum plan, above and beyond the conventional therapy data given in this section.

If you are ready to learn what conventional medicine has to offer you and your dog for cancer care, please read on. Find your dog's cancer and absorb the information. I'll see you at the end.

Please note: when I use the word "cure" in the following pages, I mean a complete lack of recurrence. As with successful surgical removal, for example, "cure" means the cancer is totally absent from the body.

## Important Points to Remember

- Most cancer names come from the part of the body where they originated, or a description of what the cancerous cells look like underneath a microscope.
- The conventional medical perspective uses surgery, chemotherapy and radiation to treat cancer. Treatment plans are designed based on the type of cancer.
- There are many different treatment options for the many different cancers. Just because one treatment works for one kind of cancer doesn't mean the same treatment will work for another kind of cancers. The information in this book is offered as a guide, but you should always consult your vet and/or oncologist about treatment plans that will be right for you.
- Some cancers of a certain kind will be less severe than others of the same kind. Every dog is different and every outcome will be different. Please don't take the survival statistics in this next section as the final word on your particular dog and her particular cancer.
- The Full Spectrum Cancer Care approach detailed later in the book will provide you with a much wider range of available treatment options, and it will include a much broader and—in my opinion and experience—more supportive perspective.

# Chapter Ten: Transitional Cell Carcinoma— Conventional Approach

## What Is Transitional Cell Carcinoma?

Transitional cell carcinoma (TCC) is a malignant cancer usually occurring in the lining of the bladder.

The bladder is shaped like an empty balloon, and it collects urine before the body releases it as waste. TCC grows from the inside lining of the balloon, slowly taking over the space that is used for holding urine.

## What Are the Signs?

Common signs are blood in the urine, repeated bladder infections, straining to urinate, and urinating small amounts frequently.

## What Causes This Cancer?

According to the conventional perspective, there are several contributors to TCC development. Pesticide exposure, especially in yard spray, is a big factor.

Another cause could be if your dog had a previous cancer of a different kind and was treated with the chemotherapy drug cyclophosphamide.

Conventional knowledge states that females are twice as likely to get TCC as males, and Scotties are genetically predisposed to it.

And as I mentioned earlier in the section on spaying and neutering, dogs can be at higher risk for this cancer due to being fixed. Neutered males are four times more likely to develop TCC than intact males.

## How Does This Cancer Behave?

Transitional cell carcinoma is fairly aggressive. It can spread to other sites in the body—and it does so in up to 4 out of every 10 instances. Sometimes it goes to the lungs, the bones, or the lymph nodes (glands) in the area near the bladder.

## Expectations with Conventional Treatment Only

A common chemotherapy plan is a combination of piroxicam with mitoxantrone. This can help in around 40% of dogs. The tumor will shrink or go away temporarily, and median survival time is about a year.

For a less aggressive plan, some owners opt to only use piroxicam. About 2 dogs in 10 will benefit from this drug by itself. The median survival time in dogs treated with piroxicam alone is about 6 months.

TCC is locally aggressive and difficult to truly remove with surgery. Surgical removal may buy more time, but this type of tumor usually comes back. Cancer cells are often left behind after the initial surgery. Also, the position of the tumor can make surgery difficult or, in some cases, impossible. Occasionally the tumor is small and in a position where “debulking,” or removal of what is visible to the eye, can be done. If the TCC is in an area where it can be debulked, this should be considered.

Treatment with radiation alone is currently being looked into for this cancer type, but it is not yet commonly used. Surgery with radiation options will vary on a case-by-case basis. You should discuss these options with your vet and oncologist.

# Chapter Eleven: Tumors of the Nose and Sinuses— Conventional Approach

## What Are Tumors of the Nose and Sinuses?

Several different cancer types can be found in these areas. The most frequent are squamous cell carcinomas, but fibrosarcomas and many others have been found here. All of these cancers arise within the inside of the nose or the sinuses. They expand and form tumors, which can then invade vital surrounding structures like the throat.

## What Are the Signs?

Signs of these tumors include a greenish-yellow discharge from the nostrils (most commonly from only one side), nasal bleeding, sneezing, noisy breathing (snorting or snoring), a visible swelling, and sometimes coughing or gagging. If the tumor expands into surrounding areas, it may interfere with important survival functions like eating or breathing.

## What Causes This Cancer?

The allopathic perspective recognizes that genetic tendencies in certain blood lines make for higher incidences of these tumors. Collies are one example. Environmental tobacco smoke slightly increases the risk for nasal cancers, as does the use of kerosene and coal household heaters, and other airborne carcinogens.

## How Does This Cancer Behave?

Nasal tumors are usually locally aggressive, but some do also spread into more distant areas. These tumors infiltrate, invade and obstruct. The areas invaded by cancer cells gradually get destroyed because they become too compressed or lose their normal structure. Studies have found that up to 30% of nasal tumors will spread to the lungs, but this usually happens long after the tumor first forms. These tumors can also spread to the lymph nodes, the liver, the bones, and rarely to other areas of the body.

## Expectations with Conventional Treatment Only

The goals of conventional treatment are to increase lifespan and shrink the tumor, while trying to keep a good life quality. With current available treatment, it is very difficult and very rare to cure tumors of the nasal passages.

Conventional treatment of cancers in the sinus area usually includes radiation. Unfortunately, radiation techniques are not widely available. The University of Wisconsin (Madison) Veterinary School has the most precise radiation for these tumors, and the University of Florida Veterinary School is using another radiation technique that may be applicable.

For most nasal tumor types, radiation therapy by itself can increase survival by a year, but only in about half of dogs. Some sources say about 1 dog in 4 will live 2 years following radiation treatment. For radiation to be most successful, it should be combined with CT scans. CT (computed tomography) is a tool used to give a 3-dimensional image of the cancer, which normal X-rays cannot accomplish. The CT scans are capable of finding problem areas overlooked by X-rays. These areas, especially the back of the sinuses in the nasal cavity, need to be exposed to the radiation beam in order for this treatment to be more effective.

A new advanced and aggressive plan for nasal tumors includes radiation therapy every weekday for about 3 weeks, along with cisplatin, a chemotherapy drug. In this plan, a sponge-like material containing the cisplatin is surgically implanted in the muscle. This spongy material, called an open-cell polylactic acid polymer, slowly delivers the cisplatin into the bloodstream and penetrates the tumor over the 3 weeks of radiation. The approximate survival time using this protocol is 580 days.

Chemotherapy with cisplatin alone does improve life quality, but not life expectancy. About 1 in 4 nasal tumors will shrink with cisplatin alone.

Most nasal and sinus tumors are difficult to remove because of their location and lack of clear boundaries, and surgery by itself does not improve life expectancy or life quality. However, when the tumor is close to the front of the muzzle, surgery can be performed—either by itself or combined with radiation—to try to remove the tumor.

There is one hopeful exception to these rather grim conventional therapy statistics. A fairly rare type of nasal tumor, called a transmissible venereal tumor (TVT) is caused by a virus. It is transmitted when a dog's nose contacts the genitals of an infected dog. If your dog has a nasal tumor, TVT is the best kind of tumor you could hope for, because radiation can successfully *cure* TVT in 7 out of 8 dogs. Vincristine is a chemotherapy drug that is also good for TVT, and there is a high incidence of curing TVT with vincristine alone.

# Chapter Twelve: Hemangiosarcoma— Conventional Approach

## What Is Hemangiosarcoma?

Hemangiosarcoma is a cancer of the blood vessels—the arteries or veins. The cancer grows out of the wall of the blood vessel, most commonly those found in the spleen, the skin, and the liver; occasionally it occurs in other areas, including the heart.

Since these tumors come from the walls of blood vessels, they are usually filled with blood. These tumors can get very large, especially in the spleen.

## What Are the Signs?

It depends on where the cancer occurs.

Hemangiosarcomas in the spleen sometimes cause weakness, especially in the hind legs, and decreased energy that stays for a day or two, then goes away only to reappear weeks to months later.

This "waxing and waning" appearance is caused when the tumor bleeds. The blood goes in and around the tumor, which causes weakness and wobbliness in the dog. The gums, which are normally pink, turn very pale or even white. Then the blood goes back into the circulation. The dog will pep up again, stop wobbling, get strong and have a return of energy. The gums that were pale return to pink. This is called "autotransfusing".

Autotransfusing is the body's way of recovering blood within the abdomen. However, sometimes the blood loss is very rapid, and the dog might have signs of blood loss that get worse and worse, which can sometimes be fatal.

When hemangiosarcomas occur on the surface of the skin, they tend to show most in dogs with pale skin. They look like small red dots early on, and then turn into purplish-black, raised growths. They bleed easily if scratched.

Occasionally, growths will happen underneath the skin and feel like fluid-filled swellings.

Heart failure can happen if the tumor occurs in the heart, though this is rare. Sometimes this cancer simply shows signs like weight loss, decreased appetite, and less energy.

## What Causes This Cancer?

According to conventional wisdom, genetics is the culprit. Some breeds especially prone to hemangiosarcomas are Golden Retrievers, Labs, and German Shepherds. The skin form of this cancer can be brought on by sunlight (UV radiation), especially in dogs with light skin.

There is also now evidence that spaying and neutering increases the risk of hemangiosarcoma.

## How Does This Cancer Behave?

Hemangiosarcomas have a fairly high rate of metastasis when the primary cancer occurs inside the dog's body. By the time the tumors are first diagnosed, they tend to have already spread from their original location.

Hemangiosarcomas starting in areas of skin exposed to sunlight are much friendlier, and many can be easily removed without any metastasis, unless they have been allowed to grow for a long period of time.

## Expectations with Conventional Treatment Only

Surgery is heavily relied upon to remove this cancer. The spleen is either partially or completely removed if the cancer is found there.

Less than 10% of these dogs make it more than a year after surgery. The vast majority of dogs with hemangiosarcomas of the heart will not live more than 7 to 8 months, sometimes much less with conventional care.

The skin form of this cancer can very often be cured with surgery alone (8 out of 10 dogs). If the tumor extends deep into the skin and under it, the cure rate with surgery is much lower (2 out of 10 dogs, with a survival rate of about 6-12 months after surgery).

Chemotherapy with doxorubicin after spleen removal increases survival times to about 4.5 to 6 months. In dogs with the cardiac form of this cancer, doxorubicin chemotherapy without surgery has been found to help for up to 5 months.

Radiation treatments have not been very useful for this cancer type. In dogs with very severe hemangiosarcoma of the skin that could not be operated on, radiation was used and helped 2 out of 5 dogs treated.

## New Conventional Veterinary Technologies For Hemangiosarcoma

Dr. Gregory McEwen at the University of Wisconsin (Madison) Veterinary School has been researching hemangiosarcoma of the spleen.

To improve survival after spleen removal, Dr. McEwen used the chemotherapy drugs doxorubicin and cyclophosphamide, along with an immune stimulant called liposome-encapsulated MTP-PE (L-MTP-PE, or liposome-encapsulated muramyl tripeptide phosphatidylethanolamine). The reported survival time increased to about 9 months. However, the drug is not yet approved by the FDA for treatment of humans and will be difficult for most dog owners to gain access to.

There is also some new research being done with drugs that slow the growth of blood vessels and spread of hemangiosarcomas, which may help with chemotherapy success. As of now there is no explicit data arising from this research, but it might be worth checking into.

# Chapter Thirteen: Melanoma— Conventional Approach

## What Is Melanoma?

This cancer should be called malignant melanoma, to convey that it is not a benign growth (although common use does imply that it is an aggressive cancer). Melanocytomas, on the other hand, are benign tumors.

Both melanomas and melanocytomas arise from the cells in the skin that produce dark pigment (browns and blacks). This pigment, melanin, is what creates dark hair or dark skin. These pigment cells undergo initiation and promotion, turning into cancers. They occur anywhere there is dark coloration of the skin, from the inside of the mouth, to the toes, to the body, and even sometimes in the eye. The tumors often look rather knobby, are almost always dark and fleshy, and feel solid when touched. The more aggressive ones are often firmly attached to the body with a broad base.

## What Are the Signs?

Since they usually begin on the outside of the dog, the first sign of melanoma is generally a simple, dark, visible mass. Later in the progression melanomas will spread internally, often to the lungs. This can cause weight loss, decreased appetite, coughing, and sometimes blood in the material coughed up. The mass gets larger and occasionally becomes ulcerated and infected.

## What Causes This Cancer?

According to allopathic medicine, sunlight does not increase the odds of melanomas in dogs. The conventional viewpoint is that genetics is the biggest contributor, increasing the risk of melanomas in certain breeds. The Chow Chow is one example.

## How Does This Cancer Behave?

Not all melanomas are equally problematic. On haired skin, many of the melanin-containing growths are benign melanocytomas. However, most of the melanomas found in the mouth, or at the junction between skin with hair and skin without hair (like on the edge of the lip), are quite aggressive.

Another common location for aggressive melanomas is on the toe, especially at the junction between the haired and non-haired skin found on the edge of the nail bed. The melanomas at these sites often are bad news. They frequently and quickly spread to lymph nodes, liver, adrenal glands, and lungs.

## Expectations with Conventional Treatment Only

Surgery is the main conventional treatment for melanomas. Since this tumor type varies in behavior, I will look at three different groups.

**Melanoma of haired skin:** Most often, surgery will cure these.

**Melanoma of the mouth:** Surgery can help, depending on the size of the tumor when the operation occurs. If no other conventional treatment is used in conjunction with surgery, approximate survival times range from only 3 months for the very large oral melanomas, to 18 months for very small ones.

If the tumor cannot be operated on, some oral melanomas will respond to radiation. About 3 out of 4 tumors will shrink, but this response is short-lived. The tumor will probably reappear.

Chemotherapy is not very useful for oral melanomas. Since this type of cancer spreads so quickly, only about 1 in 5 dogs will respond to chemotherapy. The drugs cisplatin and piroxicam are able to achieve an approximate survival time of 4 months in these dogs.

In 1994, Special Veterinary Services of Berkeley, California did a study showing that an implant containing slow-release cisplatin could help with oral melanomas. This injected implant was a gel, and allowed the cisplatin to be released directly into the tumor itself, destroying many of the melanoma cells. About 14 out of 20 dogs responded, and in over half of those 20 dogs the tumor regressed completely. These dogs with complete regression lived almost a year.

**Melanoma of the toes:** The conventional treatment of choice with digital melanoma is surgical removal of the toe, otherwise known as amputation. However, these tumors have usually spread by the time surgery is done, because they metastasize so early. Even if there is no evidence on X-rays or other tests, there is usually micrometastasis (microscopic spread). In the rare case that there is no detectable evidence of spread at the time of surgery, about half the dogs operated on will survive another a year. About 1 in 10 will make it another 2 years.

I have not found published statistics for chemotherapy and radiation specifically for digital melanomas.

## New Conventional Veterinary Technologies For Malignant Melanoma

A melanoma vaccine is now available to veterinary oncologists. They can purchase this vaccine through Merial, the manufacturer, or it can be accessed through treatment at the Animal Medical Center in New York City. (Go to [www.amcny.org](http://www.amcny.org), click the clinical trials link, then the melanoma vaccine link.) The AMC cannot ship the vaccine due to postal regulations. This vaccine is not intended to completely cure malignant melanomas, but to increase lifespan after surgery (and possibly radiation) by boosting the dog's immune system. No statistics on its success rates were available at the time of publishing.

There are two other locations for similar immune stimulation technologies. One is the University of Wisconsin (Madison) Veterinary School where Dr. Ilene Kurzman is studying a tumor cell vaccine. Also, at the University of Florida Veterinary School, Dr. Rowan Milner is working on another vaccine.

The same immune-stimulating injection that is beneficial in hemangiosarcomas (L-MTP-PE, or liposome-encapsulated muramyl tripeptide phosphatidylethanolamine) may also help with malignant melanomas. Gregory McEwen at the University of Wisconsin (Madison) Veterinary School is working with this vaccine, but it is not yet available to the public.

All of these approaches aim to stimulate the immune system to attack the spreading melanoma cancer cells. They are very new, very experimental, and they may or may not help.

# Chapter Fourteen: Lymphosarcoma— Conventional Approach

## What Is Lymphosarcoma?

Lymphosarcoma (LSA), also called commonly called lymphoma, is a cancer of the lymphatic system.

As mentioned earlier, the lymphatic system is a series of tubes and glands in the body, called lymph nodes, which act as “kitchen sink strainers” to isolate and remove invading infections. When you have a cold, you can sometimes feel the lymph nodes in your neck getting larger due to their extra activity.

The cells in the lymphatic system are a certain type of white blood cells called lymphocytes. Lymphocytes attack and destroy invaders (viruses, bacteria, etc.) and are also active in cancer surveillance. The lymphocytes travel through the body in a clear fluid called lymph, which has its own circulation around the body, just like blood.

It is bizarre that cancer happens to the very cells that are active in protecting the body against other cancer types, but that is the case with lymphosarcoma.

The most common form of lymphosarcoma is the multicentric form, which makes up about 80% of all cases. In multicentric lymphosarcoma, cancer cells can be found all throughout the lymphatic system, in many different locations in the body.

The potential for this kind of spread is obvious, since the lymphatic system stretches around the whole body.

The liver and spleen are very common areas for LSA as well. Other occurrences of LSA are in the wall of the stomach or intestines. Sometimes it occurs in the heart, the kidney, or the bone marrow. Occasionally it can be found in the skin, the brain, or the eye.

## What Are the Signs?

The signs really vary because so many different areas can be affected. Common signs in most cases are weight loss, decreased appetite, and less energy. There are also unique signs that depend on the organs involved.

The multicentric form causes lymph nodes to increase in size.

The form in the stomach and intestine causes diarrhea and vomiting.

LSA of the kidney can cause vomiting and increased thirst and urination.

The form in the heart causes heart failure, evidenced by coughing, swelling in the belly, weakness, and labored breathing.

The skin form will cause crusting and sometimes blistering.

Lymphosarcomas of the brain can cause many different problems including wobbliness, seizures, blindness, and erratic behaviors.

LSA in the eye can cause loss of vision, eye swelling, and discoloration.

The liver and spleen forms usually just show the shared signs of loss of appetite, weight loss, and low energy.

If the bone marrow is invaded by LSA, low red and white blood cell counts and low platelet counts can occur. A low red cell count is called anemia, which causes low energy levels. Low white counts allow for bodily infections, and low platelets cause easy or spontaneous bleeding. Such bleeding can occur from the nose, in urine or feces, in the whites of the eyes, or in the skin (appearing as bruises or red spots).

## What Causes This Cancer?

The conventional veterinary medicine perspective, as usual, is that genetics and bloodlines are to blame. Boxers, Labs, and Cocker Spaniels are some of the genetically predisposed breeds.

Published data concludes that airborne carcinogens such as herbicides, paints, and asbestos may also be a cause. LSA is more common in dogs living in a city. Electromagnetic fields, like those around high voltage circuits or power lines, are also associated with a higher risk of LSA in dogs.

## How Does This Cancer Behave?

Lymphosarcoma is especially tricky because cells in this cancer are free to move around the body. Once this cancer occurs, it is always assumed to have spread, because of the highly mobile nature of the cells involved. It can be found anywhere in the body.

Wherever it occurs, LSA invades normal tissue, usually causing it to thicken, enlarge, and lose its normal function.

It can, however, simply remain in the circulation.

## Expectations with Conventional Treatment Only

So far, conventional treatments have not been successful at curing this cancer in dogs.

However, among all cancers, LSA is one that is very sensitive to both chemotherapy and radiation. This means that most dogs will respond to these treatments, and that the cancer will stay away (in remission) for longer than most other cancers.

There are many different chemotherapy approaches to this cancer and many different published results. A drug mixture called COPLA is a common protocol (a combination of cyclophosphamide, vincristine, prednisolone, L-asparaginase, and doxorubicin). Survival with this treatment is approximately 6-10 months, and the signs of cancer usually go away for about 6 months. Approaches like this one are based on a combination chemotherapy plan developed at the University of Wisconsin.

Single-agent chemotherapy (meaning using just one drug) with doxorubicin alone is a much less complicated and more convenient plan, with fewer treatments. About 4 out of 5 dogs will respond to doxorubicin, and this improvement usually lasts about 9 months. About 1 in 3 dogs will make it a year. As far as chemotherapy goes, this is a pretty good approach that is gaining a lot of favor.

There is some evidence that radiation treatment of half the body, twice daily with conservative doses, may extend survival times when used in conjunction with chemotherapy. This is called Half-Body Irradiation.

LSA is never curable with surgery.

## New Conventional Veterinary Technologies For Lymphosarcoma

Bone marrow transplantation is a very new procedure for dogs, where healthy bone marrow is surgically implanted in dogs undergoing cancer treatment and radiation. The advantage of this surgery is that much higher doses of chemotherapy can be used in treating the cancer, especially higher doses of cyclophosphamide. The goal is to achieve much longer remissions. This procedure is expected to be available at Washington State University Veterinary School sometime in the very near future. The contact there is Dr. Jeffrey Bryan.

Dr. David Vail and Dr. Ilene Kurzman are investigating a vaccine for lymphosarcoma at the University of Wisconsin (Madison).

Also, a new blood test for markers of LSA is now available from Pet Screen, at the following web address:

<http://www.pet-screen.com/web/petscr/index.cfm?s=1>

# Chapter Fifteen: Mammary Cancer— Conventional Approach

## What Is Mammary Cancer?

Mammary cancer is another name for breast cancer. Though dogs do not have the same kind of breasts as humans, it is the same organ.

The mammary gland is located within the breast. Dogs have up to ten of these mammary glands, arranged in two rows of 5 glands each. They are easy to find in dogs that have not been spayed, as the nipples are more developed than in dogs that have been spayed. The normal function of mammary glands is to make milk for the nursing pups.

Cancers in these glands come from several of the different structures within the gland. After tumors grow, some of structures will get secondary infections and become ulcerated.

## What Are the Signs?

Dogs with mammary cancer will always have a lump within at least one of the glands. Roughly 60% of the time there is a mammary tumor in more than one gland. About 7 out of 10 of these tumors will occur in the last two pairs of glands, the ones furthest towards the tail-end of the dog.

Some of the lumps are small and are only detectable when felt with the fingers. The cancers in the mammary gland feel like very firm balls within the glands themselves.

As time goes on, they will grow. They can become inflamed (red and warm to the touch) and in some cases they can break open and bleed.

When the sickness gets very advanced, dogs with mammary cancer will lose energy, body weight, and appetite.

## What Causes This Cancer?

The conventional viewpoint is that simply the presence of reproductive hormones causes mammary cancer, especially progesterone and estrogen. These hormones are secreted by the ovaries, which are involved in fertility, pregnancy, and milk production. As discussed in Chapter 3, the risks of mammary cancer drop significantly if you spay a female dog at an early age.

There is now recognition that a high level of fat in the diet is also a risk factor for mammary cancer in dogs.

There are certain lines of dogs that are more prone to mammary cancer as a consequence of breeding. Some of these breeds include Poodles, English Cocker Spaniels, and Dachshunds.

## How Does This Cancer Behave?

Some sites of mammary cancer arise from the milk production cells, some from small bits of muscle within the gland, and some from the connective tissue that holds everything together.

Different cancers within the mammary gland have different behaviors, and each cancer has a different name, depending on the type of tissue it is made out of and how aggressive it is. You can find out the name and expected behavior of a given mammary cancer from the biopsy report.

Of all the mammary tumors that grow in dogs, about half are malignant, while the other half are benign and do not pose a health threat.

Adenomas, benign mixed mammary tumors, and benign myoepitheliomas are not fatal.

Carcinomas, malignant myoepithelioma, and sarcomas are the dangerous ones, especially inflammatory carcinomas. There are different kinds of carcinomas and sarcomas, and none of them are friendly.

In later stages, aggressive mammary tumors will metastasize, often spreading to the lymph nodes or the lungs.

## Expectations with Conventional Treatment Only

This is one type of cancer that does not have a lot of published data on expectations with conventional treatment. I find this fact odd, as we deal with mammary cancer frequently in dogs.

Regardless, I have presented what is known and relevant at this time.

Surgery is the mainstay of conventional treatment. There are many different opinions about the best way to perform the surgery. Some vets like to remove the tumor only, while some prefer removal of the whole gland or several glands, and opinions vary on whether to remove the lymph nodes that drain the area. At this time, the evidence is mixed as to which approach is the best.

There is some new research to suggest that un-spayed dogs with mammary cancer should be spayed to decrease the chance of new tumors, while older studies say this benefit is actually not seen. Still, most vets will recommend spaying at the time of mammary cancer surgery.

Taking all the mammary tumors as a group, surgery by itself is expected to cure half of the dogs with these tumors. Personally, I find this statistic rather bleak, and my own clinical experience makes me more optimistic for higher cure rates.

Still, there is a fairly high probability (slightly more than 50%) that new cancers will develop in other mammary glands even after surgical removal.

There are no really good studies done in dogs as to the best chemotherapy plan for mammary cancers. One reason is that there are actually so many different types of cancer in the mammary gland, and each one would have to be studied. Occasionally, single-agent chemotherapy plans have involved mitoxantrone or cisplatin. There is no significant data on their effectiveness in canine mammary cancer at this time.

The most common chemotherapy plan used on mammary tumors is a combination of fluorouracil, doxorubicin, and cyclophosphamide. The most fatal of the mammary cancers in dogs—inflammatory carcinoma—has been treated with this chemotherapy combination. The combination of these three

agents about doubled survival in dogs with inflammatory carcinoma, from just over a month to a little more than two months.

Most other mammary cancer types, even if malignant, have much better survival times than this.

## New Conventional Veterinary Technologies For Mammary Cancer

In a report not yet in print the time of this book's publication, a human cancer drug called tamoxifen was studied for its effect on canine mammary cancers. It was shown to shrink the tumors of 7 out of 10 dogs.

# Chapter Sixteen: Osteosarcoma— Conventional Approach

## What Is Osteosarcoma?

Osteosarcoma is cancer of the bone. In 75% of all cases, osteosarcoma starts in the long bones of the legs, most often only affecting a single leg. Occasionally it can occur in other bones of the body, but this is rarer. The tumors actually grow within the bone itself, causing the bone to expand.

## What Are the Signs?

One of the hallmarks of this cancer is pain. The pain almost always causes a limp, especially as the tumor develops. The bone containing the tumor will expand, and this can often be felt as a swelling, especially if it occurs in bone that does not have a lot of muscle around it, such as within the lower legs.

Often these tumors are perceptible to the naked eye, especially if the tumor is on the lower leg. The areas higher up are usually covered in muscle, and this muscle sometimes prevents the swelling from being visible.

If the cancer gets very advanced, sometimes the bone will weaken at the tumor site. This weakness can occasionally lead to a fracture in the bone, caused simply from normal weight-bearing activities like walking. This is called a pathological fracture, which means a fracture due to a weakness-causing disease (rather than trauma like a fall or getting hit by a car).

As osteosarcoma spreads, it can cause decreased appetite, weight loss, and problems in the lungs or other areas.

## What Causes This Cancer?

The conventional veterinary viewpoint recognizes that large breed dogs are more prone to osteosarcoma. Breeds like Rottweilers, Irish Wolfhounds, and Greyhounds are at increased risk, among others. Dogs weighing over 75 pounds are more than twice as likely to get this cancer, compared to dogs smaller than that.

As I discussed earlier, it is now recognized that surgical sterilization of purebred dogs, especially Rottweilers, increases the risk of osteosarcoma.

A study was done that combined data from North American Veterinary Teaching Hospitals over the span of 14 years (1980-1994), and looked at about 7,000 purebred dogs. It found that castrated purebred dogs were twice as likely to develop osteosarcoma as dogs that had not been neutered.

Rottweilers spayed or neutered before one year of age were found to have a 1 in 4 chance of developing osteosarcoma. This represents an increased risk of between 3 and 4 times the occurrence in non-sterilized dogs.

Osteosarcoma has also been known to occur in areas where a bone has been fractured and repaired by hardware like bone plates. Even bullets lodged in dog bones have been shown to cause this cancer. Occasionally this cancer can occur where there was a previous infection.

Bone plates, bullets, and infections are indeed very rare risk factors, but they are risk factors nonetheless.

Notice that all of these things cause inflammation. Inflammation is one of the underlying causes of cancer covered earlier in this book and not often discussed in conventional veterinary circles.

## How Does This Cancer Behave?

Osteosarcoma is known for local invasion, where the tumor sends cells out into the surrounding bone. It usually grows rapidly, becoming very painful within a few months.

Osteosarcoma is also known for metastasis, especially micrometastasis, which is where tumor cells have spread but due to their small size they are invisible on X-rays or blood tests. Most osteosarcomas have undergone micrometastasis by the time they are diagnosed, which makes this type of tumor a particularly tough one.

These tumors will occasionally spread to other bones in the body. There are no definite statistics to tell what percentage of dogs experience micrometastasis, because, by definition, we cannot tell when micrometastasis has happened. However, it is estimated that 90% of dogs already have micrometastasis at the time of osteosarcoma diagnosis.

## Expectations with Conventional Treatment Only

Surgery is a main part of conventional treatment for this type of cancer, with amputation being the treatment of choice. Some benefits of the surgery include less pain than living with the tumor, removing the source of metastases, and prevention of fractures.

Often the dog is already limping or walking on three legs anyway, and the rehabilitation is only about two weeks. Putting the affected leg in a sling before surgery can test your dog's ability to use three legs. However, if an X-ray shows visible signs of spread, surgery is not advised.

Survival after amputation alone has an approximate duration of about 4 to 5 months. About 11% of these dogs will make it a year, and approximately only 2% will survive 2 years with amputation alone.

Chemotherapy is most useful when combined with amputation. Cisplatin or carboplatin are the most commonly used drugs. Cisplatin is more toxic to the kidneys than carboplatin, but it is also cheaper and may be slightly more effective. When combined with amputation, either of these drugs increases the survival time to about 6 to 13 months after surgery. Often 4 doses are given, once weekly during a partial day stay at the hospital, after the surgery site is healed.

Doxorubicin has recently been used as another single-agent choice of chemotherapy for this cancer, with statistics similar to the cisplatin and carboplatin. Some combined plans have slightly improved survivals.

Narcotics like sustained-release morphine or Tramadol are often given for pain control. A new pain control drug called gabapentin is used by some vets. Some vets also recommend over-the-counter anti-inflammatories made for people; piroxicam, Metacam, Deramaxx, and others are also suggested.

Palliative radiation, which is radiation given to help with pain but not to cure the dog, will reduce the discomfort of about 83% of dogs. There is no standard treatment of palliative radiation therapy for osteosarcoma at this time, but a single dose of treatment can provide about 53 days of pain relief and give your dog a better quality of life. Different treatment centers will use different plans, but it is frequently given weekly for 4 treatments.

## New Conventional Veterinary Technologies for Osteosarcoma Surgery

What about taking out only the part of the bone with the tumor, and leaving the rest of the leg? There are some new developments in this area.

Limb-sparing surgery involves removing the bone and putting in either a metal plate or a piece of a cadaver bone (from a deceased dog) in place of it. This can be done when the osteosarcoma is found in the front leg, down by the wrist joint. Other areas in the body have high complication rates and are real gambles.

In surgeries done on osteosarcomas in the lower forearm, infection is a very common complication, occurring in at least 4 out of 10 dogs. When this happens, it often requires lifelong antibiotics.

The bizarre thing about the dogs with infection is that they tend to actually live longer than those without infections. This may be due to closer follow-up, constant antibiotics, immune stimulation due to infection, or other unknown factors.

In up to 28% of limb-sparing surgeries, the tumor re-forms in the remaining bone. However, at Colorado State University of Veterinary Medicine they are adding OPLA-Pt (a substance that contains the chemotherapy drug cisplatin) right into the surgery site during the procedure. OPLA-Pt stands for open-cell polylactic acid that contains platinum. It was reported that in selected cases, the tumor recurrence rate was less than 1 in 10.

However, this data only applies to recurrences in the leg. There can still be later growth of tumors in the other distant sites.

## New Conventional Veterinary Technologies for Pain Control of Osteosarcoma

Pamidronate is one of a group of drugs called bisphosphonates, which block bone breakdown. They help with pain and may have anti-tumor effects. They may also help block tumor spread by disrupting the formation of new blood vessels, which the tumor uses to feed itself and rob the body of resources. Pamidronate is used every 3-4 weeks as an IV injection and requires a partial day hospital stay. There is some risk of kidney injury with this drug. 4 out of 10 dogs tested had definite improvement in pain, and all 10 experienced improved bone density. This work was done at Cornell University in Ithaca, New York (my alma mater), and the main investigator was Dr. Dennis Bailey.

## New Conventional Veterinary Technologies for Radiation Treatment of Osteosarcoma

Some osteosarcomas are candidates for treatment with a radioactive drug called samarium, or  $^{153}\text{Sm-EDTMP}$  (153 samarium-labeled ethylenediaminetetramethylene phosphonate). This drug is injected as a single dose. It travels to the cells responsible for making new bone, many of which are active in osteosarcoma. As the samarium breaks down it sends out radiation, providing treatment only to the affected area and not to surrounding sites (unlike typical external beam radiation). It will go to multiple affected sites at once, making it useful for widespread osteosarcomas.

Samarium research is mostly coming out of Europe, though there is some interest in the United States. A possible location for this therapy is the Veterinary Specialty Center in Buffalo Grove, Illinois. Their website is <http://www.vetspecialty.com/index3.htm>.

The University of Missouri may be another location for samarium leads. Dr. Carolyn Henry is researching this therapy there.

## New Conventional Veterinary Technologies for Chemotherapy Treatment of Osteosarcoma

An experimental drug that has shown immune stimulation in hemangiosarcoma and melanoma patients may also be beneficial to osteosarcoma patients. The drug, L-MTP-PE, was used in 11 dogs that had osteosarcoma of the legs. It was injected twice a week for 8 weeks. When used in conjunction with 4 monthly cisplatin treatments, metastasis went down from 93% to 73%, and approximate survival time increased from about 10 months to about 14 months. The drug is not yet approved by the FDA, so most owners will have difficulty gaining access to it.

Another new therapy is the use of IL-2 (interleukin-2), which is a molecule that acts as a messenger in the body to stimulate immune responses. When given internally, the side effects of this agent outweighed any potential benefit, but there is a newer approach now. The drug is formulated as a vapor, to be inhaled directly into the lungs, where it can act on cancers that have spread there. In 2 out of 4 dogs, the lung metastasis from osteosarcomas regressed (became invisible on follow-up X-rays of the chest). Regression lasted in one dog for 12 months and in another dog for 20 months. This work was done at the University of Minnesota Veterinary School, by Dr. Chand Khanna and Dr. Jeffrey S. Klausner.

Another new development is the use of artemisinin, an ancient Chinese drug now employed in the treatment of malaria. While its use is stepping out of the bounds of conventional veterinary medicine, I included it here because it is becoming more well-known in conventional circles. It may be a valuable addition to treatment of osteosarcoma.

Cancer cells contain a high amount of iron, which helps them divide. They bring the iron in through small gates in their outer membranes. Artemisinin can enter the cells and react with the iron, forming free radicals within the cancer cells and destroying them from the inside out.

A new therapy is being investigated to get more artemisinin into cancer cells. It is hoped that the artemisinin can be linked with a molecule called transferrin, which carries iron around the body. The goal is that when cancer cells draw in the transferrin, the transferrin will act like a Trojan Horse, hiding the active artemisinin. Once inside the cancer cell, the artemisinin can react with the iron already there and form free radicals to destroy the cancer cell. This should not damage healthy cells, because normal cells do not take

up nearly as much transferrin as cancer cells, and they are also resistant to the artemisinin effect. This artemisinin-transferrin product is not yet available, but the basic artemisinin plant, or extracts from it, can be used.

Please note that some drugs related to artemisinin have caused neurological side effects in dogs when given in high doses. Artemisinin may lessen the effectiveness of some seizure-control drugs. There are some other possible effects seen in humans such as cramping, stomach/intestinal upset, and fevers. Artemisinin may therefore have some potent effects and should not be used without professional supervision. Discuss its use with your vet or oncologist.

For more information on specifics of artemisinin use, contact Dr. Lai, one of the first investigators of this compound. He is at Washington State University. You can e-mail him at [hlai@u.washington.edu](mailto:hlai@u.washington.edu) and his phone number is (206) 543-1071.

He may be overwhelmed with inquiries, so you can also try the following:

- Dr. Singh, also at Washington State University. His e-mail is [Narendra@u.washington.edu](mailto:Narendra@u.washington.edu) and his phone number is (206) 685-2060.
- Dr. Cuoto is another knowledgeable source, at Ohio State, who can be reached by e-mail at [couto.1@osu.edu](mailto:couto.1@osu.edu)
- A study is underway at the University of Ohio Veterinary School using artemisinin for cancer treatment. If you are interested, contact Dr. William Kisseberth at (614) 292-3551.

# Chapter Seventeen: Mast Cell Tumors— Conventional Approach

## What Are Mast Cell Tumors?

Mast cell tumors are the most common malignant canine tumors.

Healthy mast cells are actually part of the immune system. They perform normal functions in the body to help fight invaders. They travel around tissues, cleaning up certain types of foreign material or microbes. They are also involved in allergies and allergic reactions.

Like other cancers, this type of cancer comes from a normal cell that has been transformed into a cancer cell due to DNA mutations. The cancer can be found in different areas of the body, but most commonly it creates tumors in the skin. Less common tumor sites are internal organs like the spleen, the liver, and in the bone marrow.

## What Are the Signs?

Mast cell tumors are known as "The Great Imitators" because they have a huge range of different appearances.

Half of these tumors occur on the skin at the rear end, under the tail. 40% of them occur on the skin of the legs, especially of the thighs.

The rest are found on the head, neck, and elsewhere. The most common appearance is a raised, red bump with a top that looks a little raw or crusted. Some look like smooth, soft lumps under the skin. Others are fleshy, thick masses that stick out.

If the mast cell tumor is large and/or internal, occasionally a dog will experience a loss of appetite and weight loss, often accompanied by vomiting and sometimes diarrhea.

These tumors contain chemicals, which they will sometimes release, especially when the tumors are physically handled. Two of these chemicals are histamine and heparin. When mast cell tumors secrete enough histamine, it will cause the lining of the stomach to produce a lot of extra acid. This is what causes the vomiting sometimes seen with this cancer. These chemicals also cause inflammation and swelling at the site of the tumor.

## What Causes This Cancer?

Conventional veterinary medicine recognizes that genetics plays a role in this cancer formation. There are definite breed predispositions, some of which include the Pug, Boxer, Rhodesian Ridgeback, and Shar-Pei. These breeds are anywhere between 4 and 8 times more prone to getting mast cell tumors than other breeds.

Conventional veterinary medicine has also found that there may be an association between mast cell cancers and certain processes in the body, like allergies. There is speculation that viruses may be another contributor.

This cancer usually happens in dogs that are more than 8 years old, but it can occur at all ages.

## How Does This Cancer Behave?

Different mast cell tumors behave differently, from harmlessly benign to life-threatening. Most commonly they start in or underneath the skin.

Aggressive mast cell cancers will spread both in the neighborhood (local invasion) and throughout the body, to the lymph nodes, spleen, liver, and bone marrow.

Very rarely, mast cell cancer can start internally and spread out to the skin, which is the reverse of normal spread direction. About 1 in 10 dogs will have more than one external mast cell tumor.

Mast cells tumors are usually graded on a scale from 1 to 3, with 1 being benign, 2 being intermediate, and 3 being malignant. This grading is done

after a biopsy specimen is sent to a lab. This scale is occasionally unreliable, but it is the only straightforward way of grading these tumors to predict their future behavior. Pathologists will usually give a disclaimer on the pathology report sent to your vet, saying something like, “All mast cell tumors are potentially malignant,” even if they have a grade of 1.

Note that grading is not the same as staging, which we discussed in Chapter 4. Grading refers to the appearance of the mast cell tumor under a microscope, while staging involves looking at the dog's body to tell how much spread has happened in the body. Both grading and staging are used to attain information.

If there is evidence of spread, it is a malignant tumor regardless of the grade. If the tumor has been given a grade of 3, it is also malignant. If your dog has a grade 2 without spread, your vet should be very meticulous with frequent follow-up, because grade 2 tumors can sometimes behave like grade 3 tumors. If your dog has a grade 1 without spread, most times these are benign and removal ends the cancer, though a small percentage of grade 1 tumors act malignant. Even dogs with grade 1 mast cell tumors should be regularly monitored for new tumors and recurrence of the old tumors, in addition to lymph node checks.

Sometimes mast cell tumors take the form of a leukemia, which means that the cancer cells are found within the bone marrow and circulating around in the blood stream. Since they are internal, these mast cell cancers are not usually seen on the surface of the skin. They can be detected by a blood test called a “buffy coat smear,” or by a bone marrow biopsy.

Another form of mast cell cancer is where the malignant cells invade the lining of the intestine or stomach. This can be found by biopsy as well.

## Expectations with Conventional Treatment Only

There are a lot of different statistics on mast cell tumors. The following ones are primarily based on presentations by Dr. Greg Ogilvie, one of the world's experts on dog cancer. Data from Dr. Steven Marsden was used as well.

Surgery is the mainstay of conventional veterinary mast cell cancer treatment. Staging should definitely be done, and surgery of all mast cell tumors should be a “wide excision” (the tumor is removed along with an

additional 2 to 3 centimeters of the surrounding skin). This helps get rid of the invisible cancer cells sitting within the skin—those cells spread by local invasion.

A pathologist should also examine the edges of the removed cancer (a process called surgical margin evaluation) to see if there are still cancer cells in the dog. If there are cells left around the surgery site, a second surgery should be performed, or at least attempted.

About 50% of all mast cell tumors will come back after removal.

Grade 1 tumors are most commonly cured with surgical removal and do not often return, though all mast cell tumors are potentially malignant.

Grade 2 mast cell tumors will be intermediate. However, if the surgery is a wide excision, only 5-10% will come back.

Grade 3 tumors can be expected to return more than 50% of the time.

**NOTE:** Your veterinary surgeon should give your dog an injection of Benadryl (diphenhydramine) before performing surgery on mast cell tumors. This will limit inflammation and help block the effects of the histamine released by the tumor. Not all tumors will release much, but some can release a lot. If enough histamine is released, it is possible that dangerously low blood pressure levels could occur, putting your dog in jeopardy.

If there is evidence or strong suspicion that there may be mast cell tumor cells in the body, conventional medicine will recommend chemotherapy and radiation, though there is no single protocol.

Popular chemotherapy agents include prednisone (or prednisolone), vincristine (or vinblastine), L-asparaginase, and cyclophosphamide.

A study was done using prednisolone with vinblastine as the chemotherapy plan, following surgery on grade 3 mast cell tumors. Some cancer cells were left in the dogs. This drug combination showed improved survival times beyond surgery alone. At 1 year after surgery, 57% of dogs were still alive, and at 2 years 45% were still alive. Average remission times are about 10 weeks to 5 months with surgery, prednisolone, and vinblastine.

The chemotherapy drug lomustine (CCNU) has been shown to benefit dogs with mast cell tumors, with about 4 of 10 dogs showing varying levels of improvement. This improvement lasted roughly 100 days. This protocol was

not as beneficial as the prednisolone/vinblastine protocol, but it was less involved because it only required a single treatment every 3 weeks.

Single-agent plans using either prednisolone alone, or vincristine alone, helped about 1 in 5 dogs with mast cell tumors.

Cimetidine is an antacid, but it also has some other beneficial cancer-fighting effects—soothing the nausea, vomiting, and decreased appetite associated with mast cell tumors. It is available at most pharmacies. If ulcers occur in your dog, sometimes agents that coat the lining of the stomach, like Carafate (sucralfate), can be helpful. This is a common medication. However, Carafate should not be given within 2 hours of other drugs, as it may block their effect.

Radiation has been used by itself and in combination with other treatments. For dogs where there are cancer cells in the body after surgery, or a strong suspicion of such cells, radiation has been used as one of several weapons. Treatments are usually given once a week, over 4 weeks. Radiation of mast cell cancers in the skin appears more effective than that of lymph nodes or bone. About 48 to 77% of mast cell tumors that were treated with radiation went into remission. Unfortunately, this statistic is not very useful, as neither the stage nor the grade of the tumors were included in the study. It can be said, though, that radiation seems to help.

Different grades of tumors have different survival rates. With conventional treatments including surgery, chemotherapy, and radiation, here are the percentages of dogs that survive to 1,500 days (roughly 4 to 5 years) after treatment of mast cell tumors:

Grade 1 83%

Grade 2 44%

Grade 3 6%

These numbers are approximate. Almost all Grade 3, some Grade 2, and a few Grade 1 tumors will prove fatal much, much sooner than this.

## New Conventional Veterinary Technologies for Treatment of Mast Cell Tumors

Radiation during surgery can help tumors that have high grades or are non-resectable (cannot be fully removed).

Intralesional triamcinolone is a drug like prednisolone, except it comes as an injection. A single injection lasts much longer than a single pill of prednisolone. It can be used for mast cell tumors when complete surgical removal is not possible. The triamcinolone is injected right into the tumor, usually every 2 weeks. It helps kill tumor cells that come in contact with the injected drug. Most vets will have access to triamcinolone.

Triamcinolone mixed with safflower or sesame oil can be used during surgery. Injections or spreading of an emulsion of this drug right into the open tumor bed may help increase survival times in dogs with non-resectable tumors. Dr. Greg Ogilvie at Colorado State Veterinary School is familiar with this technique.

There is also new research using a drug called SU 111654, which blocks a reaction within many mast cell tumors in the dog. It was shown to help about half of the dogs it was used on. It is not yet commercially available and will be hard for most vets to get. Dr. Barbara Kitchell at the Michigan State College of Veterinary Medicine is familiar with this drug.

**Section IV:  
Full Spectrum Care  
For Dogs with Cancer**

## Chapter Eighteen: An Overview of Full Spectrum Cancer Care

*“If children have the ability to ignore all odds and percentages, then maybe we can all learn from them. When you think about it, what other choice is there but to hope? We have two options, medically and emotionally: Give up or fight like hell.”*

*--Lance Armstrong*

When I make a cancer diagnosis in my own practice, I describe a treatment strategy by creating what I call a Full Spectrum Cancer Care Plan. Because each dog and each cancer is different, most plans are different.

A Full Spectrum Cancer Care Plan can feature everything from chemotherapy drugs to meditation to nutritional supplements. In a Full Spectrum Cancer Care Plan, we focus on strategies and techniques that have:

- Scientific studies supporting their effectiveness
- A very strong theoretical background for effectiveness
- A very strong historical, common use that supports effectiveness
- Minimal side effects or ones that are tolerable

As you can imagine from our discussions so far, treatments from allopathic, alternative/complementary, and holistic medicine can all fall into these categories and be included in Full Spectrum Cancer Care.

As long as it holds true to those four criteria, nothing is off limits.

This can make some people uncomfortable. Some traditionalists want only allopathic treatments, while other dog owners want only alternative treatments. Regardless of your preference, I encourage you to continue reading with an open mind.

If you want only allopathic treatments, I would encourage you to read this whole section anyway. There may be some things you can introduce to your veterinarian that would be considered rational and worth trying.

And if you are an alternative health fan, I encourage you to consider allopathic treatments as viable options for your dog. In some cases, they are excellent treatments.

## Addressing All Five Facets of Cancer

Cancer harms the body in several different ways. In order for us to deal with cancer, we need to address all of them.

1. Cancer grows and spreads, which injures body parts.
2. Cancer suppresses the immune system and overwhelms the body's natural ability to fight cancer.
3. Cancer causes weight loss and physical weakness.
4. Cancer robs the body of resources for normal functioning.
5. Cancer creates poor life quality and reduced happiness.

Conventional vet care only deals with the first of these facets. Traditional medicine tries to remove the cancer and stop the harm caused by its growth and spread.

But this ignores the four other ways that cancer affects your dog!

From here through the end of the book, we will address all five areas. I will give you information about many different options, how they work, and the reasons why they can help.

Some of these techniques will be useful for treating all Hard to Cure cancers, while some will be more specific to certain cancers.

Side effects and dosing schedules are included so you have a clear action plan laid out in front of you.

*This is for informational purposes only, and should not be considered a steadfast recommendation for your particular dog with his particular cancer.*

As always, you are the one in charge! If this information resonates with you, I advise you to follow through by checking with your vet and making an informed decision.

## Check with Your Vet, and Be the Leader

Many of the things I discuss here have potent effects, and they should only be used under the supervision of a professional. Treatment ideas you take away from this book should be discussed with your veterinarian, oncologist, and/or any other professional who is involved in your dog's health. It is essential you get their agreement and approval before beginning any treatment plan.

Your vet may even thank you for bringing this information to her attention. I compiled this information after hours of deep research and study (just ask my wife, Allison). Most vets don't have or take the time to research this stuff, so they likely will not have encountered it before. Also, much of the information in this section is new to the veterinary profession as a whole.

On the other hand, maybe your vet gave you this book to read—in which case you know for sure that you have an open-minded team player on your side.

Just remember—as your dog's Primary Health Advocate, it is important that you be the team leader. Create your plan with your vet.

## Why Some High Profile Cancer-Fighting Supplements and Strategies Are Not Included in Full Spectrum Cancer Care

There are hundreds of supposed cancer supplements, treatments, and “cures” that you may have read or heard about. If they are not in my Full Spectrum Cancer Care, it is for one or more of the following reasons:

- There was no definite, documented data showing it works in living bodies, in real life.
- There were possible side effects that could have a negative effect on your dog, which I believe would outweigh the benefit.
- The evidence for its effect was only provided by the people selling the product, not by an unbiased third party.
- The cost would make it unmanageable for all but the wealthiest dog owners.
- It is so rarely used that I did not review it. (There are very few in this group.)

You will notice that Full Spectrum Cancer Care has many steps. It might seem a little involved, but trust me. If you are fighting cancer, you need a comprehensive system. Each one of the following steps is part of an overall plan to support your dog in his fight. The remainder of the book will explain in detail each item listed here.

It is critical that you read the follow-up text about each topic I outline here, for your own understanding as much as for your dog’s well being.

I appreciate you taking the time to do this for your dog, and I know your dog appreciates it, too.

## Six Steps to Full Spectrum Cancer Care

**Step One: Select Among Surgery, Chemotherapy and Radiation.**

Based on the information presented in the section on your specific cancer types, think about what conventional treatments you should include in your plan.

If your dog has a rarer type of cancer that was not specifically covered earlier, the next chapter's general sections regarding surgery, chemotherapy and radiation will still give you good information.

For these rarer cancers, ask your vet or oncologist about the available survival statistics with conventional veterinary cancer care.

## Step Two: Select Supplements to Reduce Side Effects

Several supplements can radically reduce the side effects of radiation and chemotherapy. I will cover each of these in more detail in Chapter Twenty, but here they are in brief:

- Ginger (for nausea and general cancer support, especially useful with chemotherapy and radiation)
- Coenzyme Q-10 (especially to support the heart; use with doxorubicin)
- Cimetidine (general relief of nausea and loss of appetite caused by chemotherapy and radiation)
- Glutamine (for intestinal support when diarrhea is caused by chemotherapy or radiation; not for use in brain cancer)
- Cordyceps (kidney support, for use with methotrexate and cisplatin; lung support, for use with lomustine)
- Indole-3-carbinol (an experimental supplement, which supports bone marrow when the chemotherapy drug cyclophosphamide is in use)

Keep in mind that all of these supplements should be used with veterinary supervision.

## Step Three: Shrink Tumors and/or Kill Cancer Cells

If possible, use at least two of the following treatments that have evidence for shrinking tumors or killing cancer cells. Use one agent for 10-14 days, and then rotate to a new one. I will go into a lot of detail about each of these in Chapter Twenty-One.

Please note: At the time of writing, these treatments all had limited use in dogs. They should be used under veterinary supervision only:

- Luteolin
- Curcumin
- Apigenin
- EGCG
- Artemisinin (Note that I recommend using Artemisinin for 5 days on, 5 days off. Together, those count as one 10 day course of treatment when rotating between agents as I suggest above.)

#### Step Four: Prevent Cancer Spread

We can limit cancer spread by boosting the immune system. Make sure to include at least a few of these strategies in your plan:

- Make sure your dog gets at least 9 hours of sleep, in total darkness.
- Begin a multivitamin for general body support, at maintenance doses for normal health.
- Use, if possible, at least one of the following. Use it for 10-14 days, and then rotate to a new one.
  - Branched chain amino acids
  - Modified citrus pectin
  - Doxycycline (under veterinary supervision)
- Bring your dog into the sun (except for dogs with squamous cell carcinoma and hemangiosarcoma)

All of these supplements should be used with veterinary supervision.

#### Step Five: Begin a Cancer Diet

Step Five is all about food—getting your dog on a new diet that will support optimal health and healing. There will be a lot of detail in constructing this diet, but a quick overview is here. Keep in mind that you

should start off gradually, mixing the cancer diet food with your dog's regular food in increasing proportions over the course of two weeks, until this is the entire content of your dog's diet.

- Include garlic and colored vegetables.
- Begin a fatty acid plan with krill oil or fish oil. Pick one and use it for 3-4 weeks, then rotate to another. Stop fatty acids at least 10 days before any surgery, then begin again 10-14 days after sutures are removed.
- Begin oral enzyme therapy. Mix in meals to pre-digest cancer-fighting foods. Also give between meals, 2 weeks on and 2 weeks off. Stop all enzymes 10 days before any surgery, then begin again 10-14 days after sutures are removed.
- Give indole-3-carbinol for 2 weeks on and 2 weeks off.

Keep in mind that all of these supplements should be used with veterinary supervision.

## Step Six: Improve Life Quality and Happiness

Remember how much mood and self-esteem can impact a dog's immune system? This step is very important—and the most fun for you and your dog. In this chapter, you'll get lots of tools to improve your dog's quality of life.

- Increase activities and circumstances that make your dog happy.
- Use mind-body tools as you like:
  - Meditate with your dog
  - Visualization exercises
  - Intercessory prayer
  - Touch therapies

## Reminder: This Is Research (Not Choice-Making) Time

Although I am generally unhappy with the success rates of conventional treatments for Hard to Cure cancers, it's not because I think the treatments don't work at all. They often don't work well enough, and they don't address every problem that cancer brings to the table.

In the next 6 chapters I am going to walk you through each of these 6 steps, in what you may decide is excruciating detail.

I'm not doing this to bore you, or to write a long book. I don't get paid by the word. I am doing this because I believe that you need all of this information in order to make the best decisions for your dog and yourself.

Remember, the entire last section of this book is about Making Choices. I recommend reading through every step of the Full Spectrum Cancer Care section, and then reading the Making Choices section, before you actually make any choices for yourself.

Use the next chapters to create an initial Full Spectrum Cancer Care Plan that you can go over with your vet. Then you can start to take action.

I can feel you itching to get on to the nitty-gritty, so let's dive in. First up is an in-depth look at conventional treatments, their possible side effects, and their benefits for your dog.

Ready? Let's finally get to the good stuff!

## Chapter Nineteen: Full Spectrum Cancer Care Step One—Choosing Conventional Treatments

In my opinion, if all you do to treat cancer is use the three conventional medical treatments—chemotherapy, surgery, and radiation—it’s like fighting a war with only nuclear warheads, and never sending out your ground troops. It will definitely destroy the enemy—but at what cost to the body? Moreover, the fallout can sometimes be worse than the original problem.

So choose your “big guns” wisely. I hope you have read the earlier chapter on your dog’s type of cancer, and that you have an idea of what your options are.

This chapter will go into detail about the pros and cons of surgery, radiation, and chemotherapy, and by the end I hope you will be more ready to make a fully empowered decision about your dog’s cancer care.

The following chapters on Steps Two through Six will provide you with a wide range of Full Spectrum therapies that will beautifully complement your choices in Step One.

Remember, you’re still in research mode. Listen up now to absorb this information, so you can form good decisions in the Making Choices section.

Let’s start with the cornerstone of most cancer therapies: surgery.

## Surgery

Whether the cancer is Hard to Cure or not, most vets will consider surgery before any other option. This is a reasonable and logical thing to do.

Physically removing cancer cells is effective because it literally cuts the cancer out of the body.

When it works, and the cancer is completely removed from the dog's body, surgery can feel like a miracle to the vet, the dog owner, and the dog.

### When to Consider Surgery

As a veterinary surgeon, I consider surgery a good strategy when I have a single tumor to work with, and when I am fairly confident that the cancer has not and will not spread to surrounding tissues.

If those things are true, I can be reasonably certain the surgery is worth the risk, will get the cancer out of the body, and will be worth the potential side effects.

Make sure a complete work-up is done before surgery, to minimize risks and to check for spread of cancer. This work-up should include blood work, a urine test, and imaging techniques like X-rays and ultrasounds. This allows the vet to screen the internal organs for health and to minimize the potential for complications with anesthesia and surgery.

Also, your vet should check for enlarged lymph nodes in the area of the cancer. As we know, lymph nodes are glands that act as filters in the body. Cancer cells can spread to them, which can cause them to swell. If your vet feels enlarged lymph nodes, they should be checked before surgery to see if the cancer has already spread.

If the cancer has already spread, the reasons for removing a single tumor decrease. It is very difficult to surgically remove cancer from the body after it has metastasized.

Also, surgery is a very stressful experience for the dog. When the cancer has already moved to other places within the body, I believe it is better to focus on improving life quality rather than making an uncomfortable and potentially futile effort to remove the cancer.

An exception to this can be when the size or placement of a tumor is causing other problems in the body, like pain or difficulty moving. In these cases I consider surgery in order to help lessen these secondary issues, but not necessarily as a cancer treatment.

You can see how important it is to know exactly how much the cancer has spread in order to decide whether surgery is part of your Full Spectrum Cancer Care plan.

### Possible Side Effects to Consider

Surgery is not always smooth, and it is not useful for every cancer. Cancers that are deep in the body may be more difficult or even impossible to address with surgery.

Surgery also carries some risks and complications:

- Untreated pain (when your dog is in pain as a result of the surgery, but we don't know about it so it doesn't get addressed)
- Anesthetic accidents (when the anesthesia used during the operation causes problems)
- Bleeding problems during or after surgery
- Infections in the operation site that set in after surgery
- Prolonged recovery times and intensive home care

Just because these issues are possible does not mean they are probable. You should discuss them with your vet surgeon.

### Is Your Vet the Right Surgeon?

Just like human physicians, different vets have different abilities. Some are brilliant diagnosticians, some know their drugs backwards and forwards, and some excel in the operating room.

This doesn't mean that we only have one skill, of course. Most vets are kind of like general practitioners—skilled at lots of different areas of traditional medicine. We have to be, because you never know what will walk through the door to a vet hospital.

That said, vets also have their own personal preferences for practicing medicine. It is wise to make sure whoever operates on your dog is a good, confident surgeon. If your vet is not comfortable with the surgery you have chosen for your dog's plan, get a referral.

### Why Your Vet Should Not Use Ketamine During Cancer Surgery:

One of the many medications used for anesthesia is ketamine. But according to the well-respected journal *Anesthesia and Analgesia*, ketamine has actually been found to increase the odds of tumor metastasis.

This means that when ketamine is used, more cancer may be found in the body after the main tumor is removed.

Other anesthetics, such as thiopental and halothane, can have a similar effect, but less so than ketamine. These anesthetics are not commonly used in modern veterinary medicine, but I still recommend checking with the surgeon and/or anesthesiologist.

Now let's take a look at a much more complicated cancer treatment.

## Chemotherapy

Chemotherapy is the use of a medication to treat cancer. This method is used in many cancers that are Hard to Cure.

It is important for you to know that chemotherapy does not cure canine cancers (although it can cure some human cancers).

In dogs, chemotherapy helps suppress the growth of cancers and shrinks some tumors. When this happens, the cancer is said to be in remission.

Remission means that the signs and symptoms of the cancer have been reduced. It does not mean that the cancer is gone completely or cured.

The general aim of chemotherapy in veterinary medicine is to prolong the dog's life and hopefully improve life quality.

You may be wondering why we can't cure dogs with chemotherapy when some human cancers can be cured. The reason is actually very simple.

The doses needed to cure cancer will yield unacceptable toxicity in dogs. In humans, the high levels of toxic side effects that come with a curing dose are awful to experience, but they are tolerable because we understand the reason we must endure them.

But we can't ask our dogs to tolerate the increased side effects because we can't be sure that they understand what is happening and why. Very few dog lovers would want to see their dog get as sick as she would if a curing dose of chemotherapy were administered.

Given this rather heartbreaking fact, when should you consider chemotherapy for your dog?

### When to Consider Chemotherapy

Chemotherapy may be useful if the cancer has spread, whether it has spread by local invasion, through the lymphatics, or through the bloodstream. Even if there isn't evidence of spread, chemotherapy may be used on cancers that are likely to spread based on what we already know about the cancer's behavior in other dogs.

The people most experienced in canine chemotherapy are veterinary oncologists. An oncologist is someone who has spent extra time after vet school studying oncology, which is allopathic (conventional) medicine's study of cancer.

Veterinary oncologists are skilled in making recommendations about allopathic cancer management. If you are pursuing any conventional cancer treatments, especially chemotherapy and radiation, get input from a veterinary oncologist.

Even if you are not pursuing these treatments, an oncologist's input may still prove valuable.

Not everybody has immediate access to a veterinary oncologist. Just like human oncologists, they tend to practice in cities where there is more work for them.

But no matter where you live, your vet can still *consult with* an oncologist. The big commercial laboratories such as Antech and Idexx, which process biopsy reports, have oncologists on staff and available for consults.

The Morris Animal Foundation also has an association with oncologists who offer free consultations:

[http://curecaninecancer.org/free\\_screening.html](http://curecaninecancer.org/free_screening.html)

Fair warning: Oncologists in veterinary medicine are not necessarily knowledgeable about the other parts of Full Spectrum Cancer Care discussed in this book. Some may indeed be interested and open, but others are only interested in chemotherapy, radiation, and surgery.

As you go over the chemotherapy options with your vet and/or oncologist, you'll find that chemotherapy medications commonly come in forms that can be taken by mouth at home, and others are injections and given at the vet's.

Different cancers require different chemotherapy drugs and schedules. The plan is largely based on the oncologist's experience and preference, because there is often no standard protocol that is acknowledged as the very best plan for a given cancer.

The majority of chemotherapy protocols use multiple drugs, usually involving frequent trips in and out of the hospital.

Generally, the strategy for the most effective chemotherapy plans is to give the highest, most potent dose possible, with the shortest amount of time between doses. This increases the number of tumor cells killed.

However, this can also increase the likelihood of side effects. If your plan includes chemotherapy along with surgery, and healing is expected to be simple, consider a dose of chemotherapy 5-7 days after surgery. I recommend this because if there is micrometastasis, it will often have a growth spurt during this period after surgery, and chemotherapy will hopefully stunt some of that growth. Discuss this with your vet and/or oncologist.

Let's turn our attention to a question that's probably percolating in the back of your mind: "Why doesn't chemotherapy cure cancer in dogs?"

### **Why Chemotherapy Isn't Foolproof**

Cancer cells are smart. When a chemotherapy drug is used, it kills some cells—maybe even most cells—but not necessarily all cells. The cells that

survive can continue to wreak their havoc, and in the meantime they have become what we call drug-resistant.

How does this happen?

One reason is that some of the cancer cells just did not come in contact with the chemotherapy drugs used.

When a drug is taken, either as a pill or an injection, it travels through the body. To have the effect we want, it has to contact every cell in a tumor. But some of these tumors or cancerous areas are so thick that the drug cannot fully penetrate all the way through. So some of the cells in the center of the tumor are left alone.

Worse, some of these cells may get only a very small amount of the drug, which they can then fight off.

If this happens, the cells can actually become even more resistant to the effects of the chemotherapy drug. It is almost like these cells have been given a vaccination. The amount of medication received was small enough to fight off, and now they are immune.

Some cancer cells are able to resist many different chemotherapy agents. This is called multi-drug resistance.

Some cancer cells are able to turn on a pump located in the cell membrane—the outer layer of the cell. Pumps like these are found in many healthy cells, and they function to remove toxins from cells. When the cancer cell turns on this pump, it can literally spit the chemotherapy drug back out as soon as it comes in. In this way, the chemotherapy drug is rendered completely ineffective.

The better the cancer is at creating drug resistance, the harder it is to treat with chemotherapy.

The reality is that by the time most dogs are diagnosed with a Hard to Cure cancer, the cancer may have already initiated all of these defense mechanisms. That is why chemotherapy can hold off cancer and prolong life, but rarely—if ever—actually cures it or puts it into remission.

Chemotherapy may be worthwhile, however. The Making Choices section will help you to analyze your own situation and come to the best decision.

As you look at possible chemotherapy treatments, there is something else to consider: side effects. Let's look at those now.

## Chemotherapy and Its Side Effects

Chemotherapy has gotten a very bad reputation for having a lot of side effects. The truth is that while it does have side effects, they are not always as bad for dogs as we imagine. Side effects in dogs are usually fewer than they are in humans, because the doses are smaller.

Some side effects, however, are quite severe and need to be carefully evaluated before including chemotherapy in a Full Spectrum Plan.

Almost all chemotherapy drugs work in a pretty straightforward way. They target, attack, and destroy cells that divide.

Many normal cells divide, just as cancer cells divide. All of these dividing cells, normal and cancerous, are affected by chemotherapy.

Although cancer cells are most harmed by the chemotherapy, normal cells are also affected. It is the harm caused to normal body cells that leads to the side effects in chemotherapy treatments. Cells that multiply fast and continually are especially affected by chemotherapy.

Cells that line the stomach and intestines are continually renewing themselves as a normal part of their activity. When a chemotherapy drug harms these cells, you can see sluggishness, vomiting, diarrhea, and loss of appetite.

The cells that make new blood in bone marrow are also constantly dividing. If these are harmed, the marrow makes less of the blood cells that the body needs. These blood cells include the red cells that bring oxygen to the organs of the body. When red cell numbers go down, dogs lose energy and can become weak. The areas on the gums that are normally pink will turn pale or even white.

When bone marrow is harmed during chemotherapy, the body's white blood cells are also affected. White cells are involved in immunity, and when white counts drop, the body becomes more prone to fever and infection.

Damaged bone marrow halts platelet production, too. Platelets are structures in the blood that help the body stop bleeding in the event of a wound. When platelet counts drop, a dog may bleed without reason. This can

mean bruising or reddish spots or blotches in the skin, nosebleeds, and internal bleeding, as well as blood in urine and feces or in the whites of the eyes.

Some chemotherapy drugs cause inflammation of the lining of the bladder, which can be very uncomfortable. Dogs will strain to urinate, and there may be blood in the urine.

Usually these side effects will go away when the chemotherapy drug is stopped or the doses are lowered.

However, some side effects are more serious and long-lasting. Certain chemotherapy agents can cause kidney injury or heart injury, effects which are sometimes permanent and may require lifelong medications or vet procedures that can impact quality of life for your dog.

## Before We Continue

I'm about to go into detail about common chemotherapy drugs and the side effects, so you will be able to take them into account when considering your Full Spectrum Cancer Care Plan.

If you choose to include chemotherapy, keep in mind that you can always stop, change the dosage, or switch to another chemotherapy drug if one is available.

In other words, treatment plans can be flexible.

If you follow my advice and keep a journal, you can easily track any side effects so that you and your vet can change the treatment plan.

Also, keep in mind that Step Two of the Full Spectrum Cancer Plan is aimed at supporting the dog's body in mitigating chemotherapy's side effects. There are many ways to combat the side effects and make it more comfortable for your dog to deal with chemotherapy.

## Precautions You Should Take with Chemotherapy Drugs

Some drugs used for dog cancer are extremely powerful and can affect humans as well as dogs. It is important to be very careful if and when you handle these drugs during your dog's treatments.

Many of these drugs are given in the hospital, and in that case you will not have to take precautions for yourself.

However, if you administer pills at home, *always wear gloves*. Chemotherapy drugs can leave a thin residue on the skin if handled with bare hands. This residue is not healthy.

Also, chemotherapy tablets should *never* be broken into pieces. This is because when they are broken, some of the drug will be released into the air as a puff of powder you could risk inhaling. The directions for chemotherapy drugs should always call for whole tablets, never pieces.

The exception to these two rules is prednisolone or prednisone (see below), which is not problematic in this way.

If your label directs you to break tablets, please double check with your vet or oncologist about the safety of doing so.

## How to Give Pills to Your Dog

Many dogs happily swallow pills cleverly disguised in a piece of cheese, a scoop of peanut butter, or in a pill pocket (a treat with a hollow middle, which you can buy at your vet's office or at a pet supply store).

Another way to get the pill into your dog is to open his mouth and let the pill fall down the back of the throat. Immediately follow up with a "chaser" to wash it down. You can use a squirt of water from a turkey baster or a syringe with the needle removed. If you have never administered pills this way before, you might want to get a demonstration from your vet or a nurse.

Watch your dog to make sure he does not hack the medicine or supplement back up, especially if he is resistant to taking pills.

## Chemotherapy Drugs Commonly Used In Veterinary Medicine

The names of the medications below are their original, scientific names (also called generic names). Companies may come up with their own brand names for any generic drug. For example, the generic name for a popular allergy drug is diphenhydramine, but the brand name we know it by is Benadryl.

I have broken up the descriptions of each of these drugs into categories to organize the information. These categories of chemotherapy drugs are:

- Alkylating agents
- Plant alkaloids (also called vinca alkaloids)
- Enzymes
- Anti-tumor antibiotics
- Hormones
- Other agents

I will briefly describe each of these categories and then go into detail about some common available drugs.

Please note that none of the chemotherapy drugs described is safe for use in pregnant dogs because they may harm developing puppies.

## Alkylating Agents

These chemotherapy drugs work by interfering with the DNA of cells during the division process. The drugs cross-link, or build little bridges, in between DNA strands that have started to replicate themselves. Alkylating agents anchor the DNA strands together, preventing them from separating, which prevents them from reproducing. The cells are unable to complete their cell division and they die.

Alkylating Agents may affect both cancer cells and some healthy cells, so there can be side effects. Specific alkylating agents are as follows:

- Cyclophosphamide is the most common alkylating agent. It can be given either by tablet or injection, usually in combination with other drugs. It is often used for sarcomas, lymphosarcomas, and carcinomas. Common side effects include suppression of red and white blood cells, bladder inflammation, low platelet counts, bleeding tendencies, vomiting, diarrhea, and hair loss. Note: This drug is excreted in the urine. Humans and other animals should avoid the urine of a dog on cyclophosphamide.

- Chlorambucil does the same thing as cyclophosphamide but is less potent and has fewer and less severe side effects. It comes in pill form and is often used along with other drugs to fight leukemia. It can cause bone marrow suppression and hair loss.
- Melphalan is used in protocols for the cancer multiple myeloma. It comes as a pill. It can cause bone marrow suppression after long-term use, as well as vomiting, diarrhea, loss of appetite, and rarely, lung scarring.
- Lomustine, commonly called CCNU, is another, newer member of this group. It is used for lymphosarcoma, brain tumors, and mast cell tumors. It comes in pill form. It can cause vomiting, diarrhea, mouth irritation (stomatitis), low blood cells (red, white, and platelets), and liver injury. These side effects can occasionally be permanent. CCNU can also cause scarring of the lungs, eye ulcers, and kidney injury, though these are rare.

## Plant Alkaloids

During cell division, cells form internal scaffolding, much like the frame of a house. This frame, called a mitotic spindle, supports the formation of two new cells from the single first cell. Plant alkaloids used in chemotherapy act to bind this frame, making it incapable of moving during the division process. Because it cannot move and change its structure, the cell dies.

1. Vincristine is the most popular plant alkaloid, used for treating sarcomas and lymphosarcomas. It is also a very effective drug against transmissible venereal tumors (TVT). This drug must be injected directly into a vein, never into the surrounding tissue, because vincristine will kill the tissue before it can get to the cancer via the bloodstream. Vets and oncologists must be extremely careful when giving this injection. Vincristine can also occasionally cause damage to the nerves that control the body, leading to problems like wobbliness when trying to move or stand. Other side effects, although rare, can include hair loss, constipation, vomiting, diarrhea, and suppression of bone marrow, red and white cells, and platelets.
2. Vinblastine is used for all the same cancers as vincristine, and also for mast cell tumors. Vinblastine can suppress bone marrow function, which leads to anemia and a decrease in white cells

and platelets. Like vincristine, vinblastine is injectable and has the same bad side effects if it is not injected directly into the vein. Other side effects can include nausea and vomiting, and more rarely, mouth sores, hair loss, and jaw pain.

3. Antimetabolites are plant alkaloids that work to block normal cell division, but they do it in a different way than those described above. Antimetabolites mimic the building blocks of DNA, so that when cancer cells divide they unwittingly take in the antimetabolites in their DNA. This causes weakness in the strength of the cancer's DNA structure, and results in the death of the cancer cell.

Examples of antimetabolites:

- *Thioguanine* comes in a pill and is used for some leukemia protocols. Side effects include anemia, white blood cell suppression, and platelet suppression.
- *Fluorouracil* is an injection and is used in carcinoma treatments. Side effects may include dizziness and wobbliness in the body, because it affects a part of the brain that controls balance and coordination.
- *Methotrexate* is a tablet used for lymphosarcoma. Side effects are many, including the blockage of folic acid, a nutrient that is necessary for the health of normal cells as well as the health of cancer cells. Other side effects can include suppression of the bone marrow, anemia, low white cell and platelet counts, the postponing of new hair from coming in, diarrhea, and vomiting. It can also potentially cause permanent kidney damage.
- *Cytosine arabinoside* is an injection used for leukemia and lymphosarcoma protocols. It is normally given over a 1 to 2 day stay in the hospital. Some side effects can include bone marrow suppression, anemia, and low white blood cell and platelet counts.

## Enzymes

Allopathic cancer management also uses an enzyme called L-asparaginase as a chemotherapy treatment.

Unlike the other enzymes discussed later in this section, which are given by mouth, L-asparaginase is injected directly into the body. The way it works is by cutting off a source of nutrition for the cancer cells.

Let me explain.

In order to grow, cancer cells need to have an amino acid called L-asparagine. (Note that the spelling of the enzyme and the spelling of the amino acid differ only slightly, so always make sure you know which is being discussed.)

Cancer cells get the amino acid L-asparagine from the blood, at the expense of other healthy cells in the body.

The enzyme L-asparaginase breaks down the amino acid L-asparagine. This causes the body's natural supply of the amino acid L-asparagine to dwindle, which in turn deprives the cancer cells of what they need to multiply and grow. Therefore, cancer growth is slowed or stopped altogether.

This enzyme has been most useful with combination chemotherapy plans for lymphosarcoma and leukemia. It can cause allergic reactions, but these can often be managed separately.

## Anti-Tumor Antibiotics

Another group of chemotherapy drugs are the anti-tumor antibiotics. These antibiotics can work in a variety of ways to affect tumor growth.

1. By far, the most common anti-tumor antibiotic is doxorubicin, which can be used as a single agent in some protocols, but is also effective when used in conjunction with other drugs. It is used for lymphosarcomas, sarcomas and carcinomas. It is a very potent drug, given as an injection directly into the vein. Similar to vincristine, the vet or oncologist must be extremely careful in giving a dose of doxorubicin, since it has the potential to damage the living tissue around the injection site if it is not injected directly into the vein. This drug can also cause stomach upset, inflammation of the intestine, and delay the re-growth of hair.

It can lead to bone marrow suppression and has been known in some dogs to cause injury to the heart muscles, which can be quite serious. Some dogs will develop allergic reactions during doxorubicin injections.

2. Another anti-tumor antibiotic is actinomycin D, which is used in protocols for carcinomas and lymphosarcomas. It is given as an injection and has the same effects as doxorubicin when injected improperly. Some side effects include low white blood cell and platelet counts. Its most common side effects are stomach upset such as vomiting and diarrhea.
3. Mitoxantrone is a third example of an anti-tumor antibiotic. It is used mostly for squamous cell carcinomas, and sometimes for other carcinomas and some lymphosarcomas. It is given as an injection, usually as a single agent. Some more common side effects are anemia, low white cell counts and low platelets.

## Prednisolone and Prednisone

Sometimes we use hormones in cancer treatments. The most common hormones used are prednisolone and prednisone, usually in pill form.

You may be familiar with these hormones, as they are commonly used for other dog health problems such as allergies and immune system diseases.

In the doses used for cancer, these drugs work to stop the growth of developing cancerous white blood cells. They are commonly used for white cell cancers like lymphosarcoma and mast cell tumors. After they enter the body they are very similar drugs, because the liver converts prednisone into prednisolone.

The most common side effects are excessive thirst and urination, diarrhea and vomiting, muscle loss, immune suppression, and a “pot-bellied” appearance in dogs. Long-term use of these hormones has a low-grade effect on the liver and kidney.

Prednisolone and prednisone will also worsen diabetes.

Although there are a lot of side effects, many of them can be managed fairly well (see the next chapter for more details). These drugs, unlike other chemotherapy agents, can be handled without the use of gloves.

If these hormones are used and then no longer needed, use should be tapered off, rather than stopped abruptly. This is important in order to avoid throwing some critical body hormones out of balance.

## Other Chemotherapy Agents

There are additional common agents that may be given as part of a chemotherapy protocol.

- Cisplatin is contains the metal platinum and is usually used for osteosarcoma and some carcinomas. It cross-links the DNA in multiplying cells (such as cancer cells), and the resulting DNA errors cause these cells to die. It is given as an injection, and should be given just after a large dose of IV fluids, which help to protect the kidneys from damage during the treatment. Side effects can include vomiting, anemia, low white cells, and low platelets. Occasionally, hearing loss or nerve injury that causes wobbliness can occur.
- Carboplatin is a newer drug with similar effects to cisplatin, used for the same cancers. It is given as an injection, and side effects can include anemia, low white blood cell counts, and low platelets. It costs much more than cisplatin, but the side effects are usually fewer and not as severe. Very rarely, side effects can include nerve injury and hearing loss.
- Piroxicam is an anti-inflammatory pill that helps with pain and inflammation, but also has anti-cancer effects. It is used mostly for transitional cell carcinomas of the bladder and sometimes in other carcinomas. It is occasionally used for transmissible venereal tumor. Its most common side effects are vomiting, diarrhea, and ulceration of the lining of the stomach. In rare cases it can also cause kidney injury.

That covers the majority of common chemotherapy agents used in dog cancer therapies.

Let's move on to the last heavy hitter in allopathic veterinary care: radiation.

## Radiation

Radiation is a treatment in which intense beam of energy, invisible to the naked eye, is sent directly into cancers to damage them. If the beam comes in contact with healthy cells, it will harm them, too.

Like chemotherapy, radiation is sometimes used when surgery cannot remove the cancer.

Radiation equipment is very expensive for vets to buy and maintain, and is usually only available at either large veterinary centers or at vet schools.

Sometimes radiation can help achieve a true cure for cancer—meaning the cancer will disappear permanently. These cases tend to feature small cancers that have not yet metastasized, or are not prone to metastasis.

In other cases, radiation can be used as a palliative treatment to alleviate pain, or to kill some (but not all) cancer cells.

Radiation forms free radicals inside the cells. You will recall that free radicals are molecules that are highly reactive and can damage or destroy cells. These free radicals damage the cell's DNA and its membrane, which acts like the cell's skin.

Some cancer cells will be destroyed fairly quickly after radiation, but some respond more slowly, dying off only later when the cell tries to divide.

Some cancers respond to radiation and some do not. Some responsive (also called “sensitive”) cancers include:

- Lymphosarcoma (extremely sensitive to radiation, which can reduce the tumor by more than half after a single treatment)
- Perianal adenoma and perianal adenocarcinoma
- Neuroblastoma
- Plasmacytoma
- Transmissible venereal tumor

Some cancers are less sensitive or only mildly sensitive to radiation. This means they respond fairly well, or else they respond very well but only temporarily. Nasal tumors, ameloblastoma, mast cell tumors, and skin tumors

like squamous cell carcinoma and basal cell carcinoma are common examples of mildly sensitive cancers.

Some moderately sensitive tumors go down a bit with radiation, and their growth is slowed. Examples are fibrosarcomas, histiocytomas, and nerve sheath tumors (hemangiopericytomas).

Again, the best candidates for radiation are small tumors that are known to be highly sensitive to this treatment.

If a cancer is not sensitive to radiation, radiation might be used for its palliative purposes. For example, dogs with osteosarcoma often benefit from pain-management radiation.

If the goal of radiation is increased lifespan, radiation doses are usually given several times every week, for several weeks. Some protocols require daily treatments.

When the goal of radiation is pain control or tumor shrinking, the number of treatments is usually less, perhaps once weekly for 2 to 4 weeks. The exact protocol will vary depending on the dog and the cancer.

Whether used for cancer reduction or palliative care, radiation is a very serious course of treatment and has several side effects that must be considered when making a decision about its use.

## Side Effects of Radiation

The side effects of radiation often depend on the location of the tumor.

The radiation beam is directed at the tumor or cancer cells. But to get to the problem area, especially if the cancer is internal, the beam often has to first pass through living, healthy tissue. This living tissue may be damaged along with the cancer cells.

There is also a "scatter" effect from the beam, which means that some radiation will contact areas that are not intended for treatment. Whether directly exposed to the beam or exposed through scatter, these areas of the body can experience side effects.

Side effects of radiation are grouped as either "acute toxicity" or "delayed toxicity."

Acute toxicity happens very soon after treatment, usually within days and sometimes immediately. Vomiting and lack of appetite are common, as well as inflammation of the skin at radiation site. This inflammation is usually like a severe sunburn. Redness, moisture, and some swelling may be present. Hair loss often occurs, as well as changes in the dog's coat color.

Another acute toxicity symptom occurs in the mucus membranes, the soft tissue that lines the mouth, nose, and other areas. These fragile tissues can become severely inflamed and damaged if they fall in the line of the radiation beam. The name for inflammation and damage to the mucus membranes is membranous serositis.

If the lining of the mouth is affected, eating may be painful and sores can develop that may require antibiotics. Solid foods can be difficult to eat if there are mouth sores, so meals should be soft and/or broken into small pieces. Low-sodium bullion broth can help in softening dog food.

This same inflammation effect can occur in the lungs, possibly making it painful to breathe or setting up a case of pneumonia.

Another acute toxicity symptom happens if the radiation energy contacts the area near the eyes and damages the tear system. Normally, tears are constantly produced by the lacrimal gland on the edge to the eye. These tears help to lubricate the eyeball as it moves in its socket. If this lubrication does not happen, the dry socket is extremely uncomfortable.

The tear deficiency known as "dry eye" (or keratoconjunctivitis sicca) causes the eye to become extremely inflamed, and it will start to produce a thick greenish discharge. If this happens, you will need to apply a lubricating ointment to your dog's eye, usually twice daily, for the rest of his life.

Sometimes the surface of the eyeball develops sores, causing pain and squinting, which in turn requires antibiotic drops, ointments, or other treatments.

Delayed toxicity, on the other hand, can take years to happen. If your dog is older, you may never see these effects. If a young dog receives radiation, however, these delayed effects may pop up later during his or her lifetime. These delayed toxicity effects can be numerous and serious.

Bone and ligaments can be permanently damaged, resulting in limping.

Nerve or spinal cord injury can cause instability, which leads to wobbliness during walking or difficulty getting up and moving around.

Kidney injury can cause weight loss, decreased appetite, and increased thirst and urination. Vomiting and decreased energy can happen, too.

Another possibility, according to the American Cancer Society, is actually developing another form of cancer later in life.

“Although radiation is very useful in treating some forms of cancer, it can also damage DNA. This is why bones exposed to radiation used to treat another cancer are more likely to develop osteosarcoma in the treated site later in the person's lifetime.”

Bladder cancer can also occur, with symptoms like blood in urine, straining to urinate, urinating small amounts frequently, and frequent urinary tract infections and all the attendant problems.

Delayed toxicity in the eye can result in blindness, due to either cataracts or injury to the retina, which is located in the back of the eyeball. Dogs with decreased vision start bumping into things unless they remember the “floor plan” of the area where they are. Even if they remember, they may still stumble, fall down stairs, or get lost.

Occasionally, dogs will develop infarcts as a form of delayed radiation toxicity. This is a sudden loss of blood flow in and out of the brain. It shows up very suddenly, and does not always affect the same part of the brain. Depending on what part contains the infarct, some of the more common signs include drifting off to one side while walking, holding the head sideways, or having a facial droop (palsy) on one side of the face. Sometimes these are permanent changes, but sometimes dogs can make a recovery.

Another group of side effects to consider when looking at radiation treatments is actually not due to radiation, but rather to anesthesia.

Every radiation treatment—and there can be as many as 12 or more in a month depending upon the protocol—requires general anesthesia. Anesthesia has risks of its own, including low blood pressure, slowed heart rate, low body temperature, stroke, vital organ injury, allergic reaction, and death.

Using a skilled anesthetist will mitigate the risks, but some risk is always present. From my clinical experience, it seems to me that every time an animal is anesthetized, a little bit of life seems taken from them, especially older animals. This is my opinion, not scientific fact, but I believe most vets would agree that multiple rounds of anesthesia in a short amount of time are rough on a dog's body.

Of course, there are ways to moderate some of the side effects produced by radiation therapy, and we'll go over them in the next chapter. But first, let's look at some new radiation techniques that might be useful for your dog's treatments.

### **Advanced Radiation Techniques:**

Right now, there are some pretty exciting and very advanced cutting edge technologies being used for radiation therapy in dogs.

These techniques aim to get radiation energy into tumors while totally avoiding contact with healthy body parts that might be damaged by the beam or beam scatter.

First the oncologist and radiologist get a very detailed, three-dimensional image of the tumor using tools like the CT (computed tomography) scan. Then this image is used to create precise coordinates for the radiation beam—directions for exactly where it should go. Finally, the radiation is delivered in a very focused, very tight range, based on the exact coordinates. If the beam can avoid healthy structures and provide extremely effective radiation, sometimes only a single treatment is needed.

Two new technologies are being implemented. These are expected to be most beneficial for nasal tumors, brain tumors, or bone tumors.

The first is tomotherapy, at the (Madison) Veterinary School. This technology is used for nasal and sinus tumors, and it is also being studied for osteosarcoma palliative radiation. You can contact the University of Wisconsin School of Veterinary Medicine, Teaching Hospital:

2015 Linden Drive  
Madison, WI 53706-1102  
(608) 263-7600

The second new radiation technology is called stereotactic radiotherapy. This is being developed at the University of Florida Veterinary School, for use in brain tumors and palliative treatment for small bone tumors. You can contact the University of Florida Veterinary Medical Center:

2015 SW 16th Ave  
Gainesville, FL 32610  
(352)-392-2235

Brachytherapy is another advanced radiation technique. Here, the radiation energy is contained within radioactive material and sealed in a protective shell to prevent leakage. These bundles can be shaped like small seeds, needles or tubes. The bundle is surgically implanted in an area close to, or within, the cancer. It delivers the radiation over a distinct period of time and is then removed with a second surgery. Talk to your vet to see if this procedure would be a good choice for your dog.

### My Professional and Personal Opinion About Radiation

The decision to use radiation should be made very carefully.

If I were treating my Chow Chow, Bjorn, and he was younger than one-third the life expectancy of his breed, I would *not* select radiation. I would be too concerned about the delayed toxicity effects later in his life.

If Bjorn were older, and had been diagnosed with bone cancer, I might opt for palliative general radiation for pain management using the advanced therapies I just discussed, due to the precision and limited number of treatments.

I would probably avoid other traditional radiation treatments because of the anesthesia and other risks.

Please understand that this is my opinion of how I would treat my dog. I wanted to provide my opinion for your information and consideration only, not to tell you what is right for you and your dog.

Ultimately, only you can make your own decision, with the help of your vet and/or oncologist.

In the next chapter we're going to talk about some supplements that can really help to mitigate the side effects of surgery, chemotherapy and radiation.

## Important Points to Remember

- Make sure you have a handle on the skill set of your vet. Get referrals to specialists if in doubt.
- Before making any decisions, the side effects of all treatments should be known and considered, so you can watch for them. Make sure you take notes and gather information.
- The side effects of these treatments can be lessened with various Full Spectrum additions to support the body.
- Surgery is an effective treatment because it literally cuts the cancer out of the body.
- If there are signs the cancer has already spread, the reasons for surgery diminish. Make sure a thorough work-up is done before surgery, to prevent complications and check for cancer spread.
- Sometimes cancer spreads and your vet cannot catch it because tests don't pick it up. This is called micrometastasis.
- Make sure the surgeon avoids ketamine, halothane and thiopental, which "turn on" metastasis.
- If chemotherapy and/or radiation are part of your plan, get an oncologist involved as much as possible.
- Chemotherapy and radiation can be stopped. Plans can be changed. If you are unhappy with the way your dog's treatment is going, you have every right to say so.
- Chemotherapy in dogs is used to prolong life and improve life quality, not cure cancer.
- There are several different chemotherapy agents available, all of which work in different ways. Your dog's personal protocol will depend on his particular situation.
- The stronger the chemotherapy drug, the more likely the side effects.

- Most chemotherapy plans involve frequent trips in and out of the hospital.
- Wear gloves when handling chemotherapy pills, because they are strong drugs that can get into your body if you don't protect yourself.
- Chemotherapy and radiation can affect both cancer cells as well as healthy body cells. This is the cause of their side effects.
- Radiation is a beam of high energy directed towards the tumor. It destroys cancer cells, but may also harm nearby healthy cells.
- Radiation involves many rounds of general anesthesia. This may be very hard on the body.
- Different cancers are more or less sensitive to radiation. Radiation treatment of small, sensitive tumors will have the best outcome. Radiation can be used to help with pain as well.
- Side effects from radiation can either be seen right away or many years later.
- The delayed side effects of radiation may eventually be seen if your dog is young, as they can take years to develop. They can be severe, even if they are infrequent.
- Advanced radiation technologies like stereotactic radiotherapy, tomotherapy, and brachytherapy can be used to achieve radiation's results with fewer side effects. Not all tumors are candidates, but dogs with nasal tumors, brain tumors, or bone tumors could benefit.

# Chapter Twenty:

## Full Spectrum Cancer Care

### Step Two—Managing the Side Effects of Traditional Cancer Treatments

After you have selected your traditional treatment options (surgery, chemotherapy, and/or radiation), Step Two of Full Spectrum Cancer Care is to minimize the side effects that may result from these treatments.

Weight loss, vomiting, and damages to the kidney, heart, and bone marrow can all be treated with safe, natural supplements.

I will go over each of these supplements in detail, including dosing information:

- Ginger Root
- Coenzyme Q-10
- Cimetidine
- Glutamine
- Cordyceps
- Indole-3-carbinol

## Ginger Root

Vomiting and loss of appetite are common in dogs with cancer, especially those on chemotherapy and radiation. If you've ever vomited yourself, you

know how distressing and uncomfortable it can be. But a simple food that we all have heard of can be the very best cure.

Fresh ginger root can help relieve queasiness and stimulate appetite. The active ingredient in fresh ginger is called gingerol. Gingerol has some antimicrobial effects, and also mild pain relieving effects. Additionally, it blocks a chemical signal in the body called substance P, which is released whenever there is inflammation in the body (swelling, redness, etc.).

Ginger is also believed to stimulate production of another chemical signal in the body called serotonin, which, in addition to creating a feeling of contentment, also has an effect on nausea and appetite.

The idea of feeding your dog ginger may never have occurred to you, but you may personally have experienced the power of ginger's stomach-calming effects. Many mothers open up a bottle of ginger ale when a flu virus invades their home, because it helps settle little tummies.

But it's not only a home remedy. In fact, Germany's version of the FDA (called Commission E) has officially approved fresh ginger for treating nausea.

The fresh root is likely more effective than the dried powder. My dog Bjorn loves to eat fresh ginger, but your dog might not. See what works in your house by mixing ginger with some soft food, or chopped lean meat like chicken breast or turkey breast.

## How to Give Ginger to Your Dog

Remove the skin of the root with a knife. The inside will be yellow and smell quite pungent. Using a heavy, sharp chopping knife, finely mince the yellow portion of the root.

Freshly chopped ginger can be stored for up to 4 days in a sealed container in the refrigerator. The aroma will decrease as it ages.

Give roughly  $\frac{1}{4}$  teaspoon to miniature breeds,  $\frac{1}{2}$  teaspoon for dogs under 35 pounds, and  $\frac{3}{4}$  teaspoon for dogs 36 pounds and over. Ideally, give ginger three times a day.

## Precautions

Ginger could act as a mild blood thinner by affecting the blood platelets, which are responsible for clotting. The evidence for this is

somewhat contradictory and debated, but let's be safe and stop ginger intake one full week before any surgery (after the sutures are removed, use can be resumed).

If your dog is on anticoagulant therapy (drugs designed to stop blood clotting), ginger should probably not be used. Please check with your vet if your dog is on anticoagulants.

## Coenzyme Q-10

Chemotherapy agents like doxorubicin can cause heart toxicity in dogs, which is a serious side effect. To combat this, I recommend using Coenzyme Q-10 (also called Co-Q, CoE-Q, Co-Q 10, or ubiquinone). Use Co-Q 10 under veterinary supervision.

This naturally-occurring antioxidant is found in red meat and organ meat. Dogs in the wild probably have higher levels of it due to catching and eating live prey.

Low Co-Q 10 levels have been found in many people with many different cancers, and supplementation of Co-Q 10 along with other therapies has been shown to improve survival times.

There is also some very interesting evidence that Co-Q 10 helps with depression, which makes Co-Q 10 a doubly useful supplement for your dog.

### How to Give Co-Q 10 to Your Dog

Co-Q 10 is a supplement and can be purchased through your vet or at a health food store. It is fat soluble, so make sure you give it with food, krill oil, or another form of omega-3 oil. (See the recipes later on for ideas.)

Give your dog roughly 1 mg of Co-Q 10 per pound of body weight, once daily. For example, if your dog weighs 25 pounds, try to give a dose of 25 mg, or as close to it as you can, once a day.

### Precautions

Some dogs will experience an upset stomach (loss of appetite, vomiting) on a full dose of Co-Q 10. In these cases the dose can be split into 2 half-doses, given twice daily. This usually addresses the issue.

The safety studies for Co Q-10 have not looked at infants, pregnant mothers, or nursing mothers, so please consult with your veterinarian if your dog is pregnant or nursing.

Co-Q 10 can affect blood sugar, so also consult your vet if you have a diabetic dog or a dog with blood sugar issues.

Because Co-Q 10 has an antioxidant effect, it should probably be stopped one week before starting chemotherapy or radiation. Resume dosing about a week after treatment is completed. Consult your oncologist or vet for their advice on timing issues.

## Cimetidine

This medication is found in many common over-the-counter medications for nausea, like Tagamet. Cimetidine causes a decrease in the body's production of stomach acid, which is how it soothes nausea and helps with vomiting and appetite. It should be used with veterinary supervision.

Most vets will recognize its use as an antacid, but few realize it also helps in fighting cancer. It does this by stimulating the immune system and blocking histamines.

Histamines are chemicals that reduce the cancer-fighting ability of immune cells in the body. When cimetidine goes to work blocking this effect, the immune system stays as active as possible.

### How to Give Cimetidine to Your Dog

Give 5 mg per pound of your dog's body weight, three times daily. For example, if your dog weighs 50 pounds, give 250 mg (or one and one-quarter 200 mg tablets). Try to give it a half hour before meals.

Cimetidine should not affect other conventional therapies, so it can be used continuously as needed. It can be given right along with ginger for a long-term "double barreled" approach to stomach problems.

### Precautions

Cimetidine is a very safe drug overall. However, it should not be used in late pregnancy. It can also alter the levels of some common drugs in the body

(such as some antibiotics, asthma drugs, and others), so please let your vet know if you are interested in using cimetidine. The doses of these other drugs may need to be altered a little.

## Glutamine

Glutamine is an amino acid commonly found in meat and other protein-rich foods. It is used as fuel for many body cells, especially the lining of the mouth, stomach, and intestines. Glutamine also fuels cells in the immune system and the muscles. Use it under veterinary supervision.

This is a very useful supplement during cancer treatments, especially chemotherapy and radiation. Common side effects like diarrhea and mouth irritation are eased by glutamine, which helps the cells in the intestines and mouth to rebuild quickly.

Glutamine also helps restore muscle cells depleted by cancer-related weight loss (also known as cancer cachexia). Healthy muscle cells love glutamine and prefer it as a source for high-quality fuel.

While cancer cells also have a preference for glutamine, it has been shown that, overall, glutamine supplementation has not caused cancer cell growth. The exception is cancers of the brain (astroglioma, glioma and others). In cases of brain cancer, glutamine should not be used because it can accelerate cancer cell growth.

Note that glutamine is different from *glutamate*, the chemical commonly found in some Eastern-style foods, like MSG in Chinese food seasoning.

### How to Give Glutamine to Your Dog

Glutamine is best absorbed on an empty stomach, but in my experience this may cause vomiting or diarrhea—the very thing it is supposed to be treating. That’s why I recommend you give glutamine with a small amount of food. Many health and fitness stores carry potent glutamine powders (intended for weightlifters) that can be easily mixed in with food.

The dose should be given once per day. Give miniature dogs 250-500 mg. Give small dogs under 35 pounds 800-1000 mg. Dogs between 36 and 60 pounds should receive 1,500-2,000 mg, and dogs over 60 pounds need 2,500-3,000 mg.

I recommend using glutamine during chemotherapy and radiation treatments, and for the week following, especially if your dog is underweight due to cancer.

## Precautions

If your dog has brain cancer, do not use glutamine, as it may accelerate the growth of these cancers.

In high doses, glutamine has been shown to elevate blood sugar in humans. For diabetic dogs, this could increase the amount of insulin needed. Please consult with your veterinarian or oncologist about glutamine use in a diabetic dog.

Glutamine should also not be used in dogs with seizure disorders, as it may worsen these disorders.

Please use glutamine under veterinary supervision.

## Cordyceps

Cordyceps is a fungus used for medicinal purposes every day by thousands of people in China. The small mushroom originally harvested in the wild is now commercially grown in labs and is no longer difficult to find.

Cordyceps has many protective effects in the body and is great for overall support during cancer treatment. Use cordyceps under veterinary supervision.

Cordyceps supports the kidneys when they are exposed to chemotherapy drugs that can harm them (such as methotrexate, cisplatin, and carboplatin). It can also help support the lungs and the liver when lomustine (CCNU) damages them. Cordyceps can help support and restore the white blood cells that are suppressed by chemotherapy or radiation.

Additionally, there is research that shows it helps with the fatigue caused by overall poor health.

## How to Give Cordyceps to Your Dog

Generally Cordyceps comes dried and in capsules. I find it easiest to open the capsules and mix the powder right into the dog's food.

Give 150-300 mg per pound of your dog's body weight, two to three times daily. This means for every ten pounds of body weight, give 1,500-3,000 mg (1.5 to 3 grams).

Use Cordyceps throughout chemotherapy treatments, continuing use for one week beyond the last dose of chemotherapy, then as needed.

## Precautions

Cordyceps can increase the body's natural cortisone production, so if your dog is on other drugs that are part of the cortisone family—including prednisone, prednisolone, and dexamethasone—you should adjust the dose accordingly. In general it is OK to give one-third the recommended dose of Cordyceps, but clear this with your vet. Dogs with Cushing's Disease should not take Cordyceps.

Cordyceps also decreases blood sugar, so it should be used with caution, if at all, in diabetic dogs.

Cordyceps can occasionally cause dry mouth, rash, and stomach upset. In humans, this happens in people with high blood triglycerides (fat in blood), so if your dog has high levels of triglycerides you may want to avoid Cordyceps.

Please check with your vet and use cordyceps under veterinary supervision.

## Indole-3-carbinol

This is a naturally-occurring compound found in many vegetables, especially the cruciferous veggies (Brussels sprouts, cabbage, broccoli, etc.). It has been shown to help block the carcinogenic effect of the chemotherapy drug cyclophosphamide in the bone marrow of mice. If your dog is on cyclophosphamide, indole-3-carbinol may benefit him.

Use indole-3-carbinol under veterinary supervision.

Unlike the supplements listed above, the use of indole-3-carbinol in treating dogs with cancer is pretty cutting edge.

There are fewer studies available on indole-3-carbinol than on other treatments mentioned in this book, but I include it here and also in the next chapter because of its powerful potential benefit in cancer treatment.

## How to Give Indole-3-carbinol to Your Dog

Indole-3-carbinol comes in capsule form. Mix it with food.

For every 10 pounds of your dog's body weight, give 15-25 mg daily.

### Precautions

Do not use indole-3-carbinol in dogs that are to be used for breeding, as it has some anti-estrogen effects and may reduce fertility.

Also, indole-3-carbinol may have blood thinning effects, so do not use it within ten days of surgery, or until after the sutures are removed ten to fourteen days later.

Indole-3-carbinol may lessen the effects of chemotherapy or radiation by scavenging for free-radicals. I feel its bone marrow protection effects may outweigh this negative, but you should discuss this with your vet before using indole-3-carbinol.

## After Dealing with Side Effects...Now What?

We have looked at the traditional treatments for dog cancer, and we've selected some supplements to help deal with the debilitating side effects. Now it's time to get to the really good stuff: shrinking tumors and killing cancer cells with new, cutting edge, common sense approaches.

# Chapter Twenty-One: Full Spectrum Cancer Care Step Three—Shrinking Tumors and Killing Cancer Cells

This is the chapter you've been waiting for (and the one I've been itching to write).

This is the chapter where I lay out what I'm really excited about—the most cutting edge treatments for cancer care that may actually shrink tumors and/or kill cancer cells altogether...safely and with limited side effects.

The supplements and treatments that I talk about in this chapter are being researched by scientists in several fields, and the results are exciting. But we are still learning, and so what I write here may be only the tip of the iceberg in terms of what we will learn in the future.

Most of the research on these treatments is being done in human medicine. It may seem backward to take information from human trials and apply it to animal medicine, but it's not. In fact, this is the way that vets get new medicines. We wait for human medicines to go through refining, and then we adapt what works and use it in dogs!

But here's the incredible thing about these active cancer-fighting agents: they are not drugs. They are plant-based, natural bioflavonoids, and some from foods you probably eat on a regular basis.

These supplements tend to produce less toxicity in cancer patients. So the side effects from chemotherapy, radiation, and surgery are not

experienced—or at least not experienced to the same extent—when these supplements are used.

I'll talk about some of in detail in a minute, but first let me tell you that each of these agents has been proven in placebo-controlled, double-blind studies to kill cancer in test tubes.

Now, when these agents enter the body through the mouth, it is not as easy for them to get to the cancer directly as it is in the test tube. They have to go through the digestive system and the liver first, and this reduces their bio-availability.

That's why I recommend carefully preparing these agents—which will come in food form—as directed below for maximum absorption by your dog.

I would include at least two of the treatments in this chapter in your dog's Full Spectrum Cancer Care Plan:

- Luteolin
- Curcumin (turmeric)
- Apigenin
- EGCG
- Artemisinin

There are other drugs and treatments that are promising for cancer treatment, but they need to be given by injection. Since most pet owners are not qualified to give medications by injection, I focus only on oral supplements in this book.

Let's start with the heaviest hitter: luteolin.

## Luteolin

In scientific literature, there are reams of information about luteolin and its effect on cancer cells. But most people, vets and human doctors included, have never heard of it. This is because while it kills cancer in test tubes, it hasn't been tested in the body, so it is not widely available.

Luteolin is a naturally-occurring substance found in plants like artichokes, peanut hulls, and chrysanthemums. More specifically, luteolin is a bioflavonoid, which is a plant pigment. Bioflavonoids give plants their coloring, but also have many beneficial medicinal functions, including anti-inflammatory effects and protection of blood vessels.

### How Does Luteolin Work?

Luteolin is able to shut down cancer cells through a variety of mechanisms. The following list contains the most important ways luteolin works, although there are others that I have left out, to conserve space:

- Luteolin starves cancer cells by inhibiting glycolysis, the process by which sugars are broken down in the body. When cancer cells cannot break down sugar, they cannot absorb the sugar properly, which leads to starvation.
- Luteolin shuts down another energy source for cancer cells by turning off the enzyme Fatty Acid Synthase (FAS). When FAS is turned off, cancer cells cannot get energy, so they die.
- Luteolin kills cancer cells directly by inducing apoptosis. If you remember, apoptosis is a natural death process that happens when a cell reaches the end of its lifespan. Cancer cells are able to avoid apoptosis. They keep living and dividing, behaving as if they are immortal, at the expense of the rest of the body. But when luteolin induces apoptosis, the cancer cells die like a normal cell would.
- Luteolin sabotages the DNA replication process in cancer cells. When cancer cells are dividing, luteolin literally disrupts the process, making it impossible for new cancer cells to inherit the corrupt cancer-causing DNA from the parent cancer cells. No new DNA means to no new cancer cells, which in turn leads to slower cancer growth.
- Luteolin cuts cancer cells off from vital blood supplies by blocking angiogenesis. Remember, angiogenesis is a process during which cells send signals out to make the body grow new blood vessels. When cancer cells send out these signals, new arteries and veins are grown, which bring new blood to the cancer cells. This is how the cancer robs the body of energy and feeds itself. If angiogenesis is blocked, the cancer cells cannot feed themselves, and they effectively starve.

- Luteolin shuts down cancer cells by cutting off their “self-stimulating” communication systems. Cells tell themselves to multiply by sending autocrine signals. Luteolin shuts the autocrine process down completely, rendering the cancer cells childless.

In other words, luteolin is like a Cancer Terminator. In many ways, it destroys the cancer cell’s ability to function and replicate itself. And because it’s from a natural source, and has few side effects (see below), I think luteolin is really, really, really cool.

## How to Give Luteolin to Your Dog

Please use luteolin under veterinary supervision.

If possible, give it on an empty stomach. If your dog resists taking pills without being hidden in food, use as little food as possible. I recommend luteolin as formulated by SynoRx, the brand name of which is Lutimax. Lutimax has been formulated with a “bio-availability booster” which helps the agent get to the cancer cells.

Please note: Do not give the brand name supplement Lutimax in combination with EGCG (discussed below). My studies with dogs show that one of the other ingredients (quercetin) in Lutimax could cause complications when combined with EGCG.

To decide how much luteolin to give your dog, follow this schedule:

- Toy and miniature breeds: 100 mg, once daily
- Small breeds up to 25 pounds: 100 mg, twice daily
- Dogs weighing 25-40 pounds: 200 mg, twice daily
- Dogs weighing 40-60 pounds: 300 mg, twice daily
- Dogs over 60 pounds: 600 mg, twice daily.

## Precautions

Luteolin can lower blood sugar, and may lessen a diabetic dog’s typical insulin requirement. Please discuss this with your vet.

Luteolin also may interfere with fertility. Because of this, do not use if you have a breeding or pregnant dog. Also, do not use luteolin in puppies.

## Curcumin

Curcumin is found in turmeric, which is used in cooking to color food a yellowish orange (it's what makes curry yellow).

The idea that a cancer treatment can come from curry may seem like a big leap, but this compound is already in several clinical trials for cancer treatment. In fact, curcumin is the basis for 40 different synthetic anti-cancer drugs being designed at Ohio State University.

### How Does Curcumin Work?

In lab studies, curcumin has been shown to have several effects that are beneficial for dogs with cancer:

- Curcumin causes apoptosis (healthy, normal cell death) in cancer cells.
- Curcumin starves cancer cells by preventing angiogenesis, the process by which tumors make new blood vessels.
- Curcumin slows cancer cell division.
- Curcumin decreases the activity of the enzyme COX-2. COX-2 sends signals that start cancer replication, so decreasing the enzyme results in less cancer.
- Curcumin has an antioxidant effect on the body when taken in low levels. In the higher doses required for cancer, however, it has a pro-oxidant effect. Remember, a pro-oxidant increases free radicals, which in turn can cause damage to cancer cells. Curcumin increases free radicals that destroy cancer cells, but it doesn't damage healthy cells in the surrounding tissues.
- Curcumin suppresses the production of certain molecules on the surface of cancer cells that normally allow metastasis. Fewer of these molecules results in less cancer spread.

- Curcumin disrupts the enzymes (topoisomerases) that are needed turn on genes in new cancer cells. Without them, cancer cells die.

Okay, curcumin does a lot in a test tube. What about in the living body?

Well, there is some literature that shows curcumin doesn't get absorbed into the human body when taken orally.

However, in some early clinical trials, blood tests show that the body does respond to curcumin given by mouth. In other studies, curcumin given orally to mice decreased the number of prostate cancer cells.

Curcumin has some anti inflammatory effects, which can help a little with pain control. It is also approved by Commission E (Germany's version of the FDA) for nausea and stomach upset. It provides some protection from doxorubicin's heart toxicity side-effect. Finally, it has been shown to lesson tumor development in animals.

## How to Give Curcumin to Your Dog

Please use curcumin under veterinary supervision.

You can buy curcumin in powder form, which is extracted from turmeric. You want to buy a powder that contains at least 95% curcumin. The powdered extract often comes compounded with quercetin, to help increase the blood levels. This is fine, because quercetin is safe in dogs and has its own collection of beneficial effects.

Curcumin should be given between meals, at least an hour before or after food, on a totally empty stomach. If it is necessary, you can give curcumin with a very small amount of food.

To boost curcumin's bio-availability and pump up blood levels for maximum absorption, use soy lecithin as a "carrier." I admit this is a time-consuming nuisance that makes a mess, but it can help your dog. Here's how to administer curcumin via lecithin:

- Get a 3 cc syringe, without the needle, from your vet.
- Buy some liquid soy lecithin. This is available online and at health food stores. It is a common ingredient in many foods we eat and is Generally Regarded as Safe (GRAS) by the FDA

- Empty a curcumin capsule in a small lidded container or jar, preferably one you don't mind getting stained. (Dosages follow)
- Add 1 to 2 teaspoons of the soy lecithin to the curcumin. Add enough water to thin the mixture and make a dose your dog can handle. Mix with a spoon as well as you can, cap the jar and shake vigorously to blend.
- Use the syringe to suck up the mixture and pour it in your dog's mouth, towards the back. You can also use a turkey baster.

To decide how much curcumin to give your dog, follow this schedule:

- Miniature breeds: 50 mg, three times daily
- Small breeds up to 35 pounds: 100 mg, three times daily
- 36-60 pounds: 200 mg, three times daily
- Over 60 pounds: 250 mg, three times daily

Curcumin and turmeric are yellow and will stain everything they touch, including your sink, countertop and skin. Don't spill this stuff, and store it in a container you don't care about. You might want to consider wearing gloves when you touch it, especially if you want to avoid getting it under your nails.

## Precautions

In dogs with liver or gall bladder problems, curcumin should be used only under veterinary supervision.

It may lower the insulin requirement in diabetic dogs, so please discuss with your vet before beginning this supplement.

There is some debate about curcumin worsening pre-existing ulcers of the stomach or intestine. If your dog has or may have ulcers, consult with your vet before using curcumin.

If your dog is taking anti-inflammatory drugs such as Rimadyl, Deramaxx, Metacam, or others of this class, consult with your vet before beginning a curcumin regimen. Because curcumin has some similar effects, these drugs may need to be lessened or stopped to avoid overlapping.

## Apigenin

Apigenin is another bioflavonoid, found in parsley and other small edible plants. In test tube studies, apigenin has many similar effects to luteolin and curcumin.

In a study published by the Federation of American Societies for Experimental Biology (FASEB) journal, mice were injected with cancer cells from a human prostate, and apigenin was then administered orally to some of those mice. The mice receiving the apigenin had an overall reduction in tumor of around one-third to one-half of its original size.

Sounds good, right? But how does apigenin do it?

### How Does Apigenin Work?

Apigenin kills cancer in several ways.

- Apigenin causes apoptosis of cancer cells.
- Apigenin decreases cancer cell numbers by causing cell cycle arrest—it puts the brakes on so that cancer cells cannot keep dividing.
- Apigenin decreases the ability of cancer cells to create blood vessels, which stops them from robbing the body of nutrition.
- Apigenin blocks the enzyme COX-2 (cyclooxygenase-2), so it cannot send signals to cancer cells telling them to replicate.

Apigenin has another interesting cancer-fighting effect. Cells (both healthy and cancerous) “talk” to their neighboring cells through little tunnels called gap junctions. This talking is one of the many ways that cells communicate. Apigenin blocks the gap junctions within tumor cells, making it harder for them to talk to other tumor cells. This interferes with the ability of the tumor cells to survive.

### How to Give Apigenin to Your Dog

It is very difficult to get apigenin alone, which is why I recommend using parsley as a food supplement. Other natural compounds in parsley also boost the bio-availability of apigenin in your dog’s blood levels. You need a lot of parsley to get a full dose, so always mix it with food.

Give one ounce of chopped parsley per 30 pounds of body weight, split into several portions. One ounce of chopped parsley is about 4-5 tablespoons.

- Miniature breeds: About ½ tablespoon per dose, twice daily (¼ oz total, daily)
- Small breeds, 30 pounds or under: About 2 tablespoons per dose, given twice daily (1 oz total, daily)
- Breeds 36-60 pounds: About 3 tablespoons per dose, given twice daily (1½ oz total, daily)
- Breeds over 60 pounds: About 4 tablespoons per dose, given twice daily (2 oz total, daily)

Note: Work your way up to this dose, over about two weeks. Give a small portion of the dose first, and increase slowly.

Parsley is a diuretic, so do not be surprised if your dog drinks more water and needs to urinate more than usual.

Please use apigenin under veterinary supervision.

## Precautions

Apigenin is reported to have some rare hormone-like effects. It should not be used in breeding dogs, and it should be used with caution in female dogs that have not been spayed. Consult with your veterinarian.

Also consult with your vet if your dog is taking anti-inflammatory drugs such as Rimadyl, Deramaxx, Metacam, or others of this class. Because apigenin has some similar effects, these drugs may need to be lessened or stopped to avoid overlapping.

## EGCG

EGCG stands for epigallocatechin gallate. It is part of a group of molecules called the polyphenols, and it is found most commonly in green tea. In fact, the low rate of cancer in Asian countries (as compared to the U.S.) is often linked to higher green tea consumption than elsewhere in the world. EGCG is currently in U.S.-based clinical trials for cancer treatment.

## How Does EGCG Work?

Similar to curcumin, EGCG has both antioxidant and pro-oxidant properties. Here are some of its most interesting effects:

- At high doses, EGCG's pro-oxidant properties go to work, increasing the free radicals that harm cancer cells.
- EGCG has been shown to increase apoptosis.
- EGCG causes dividing cancer cells to freeze in the middle of their growth.
- EGCG blocks signaling molecules that cancer cells use to stimulate their own growth.
- EGCG interferes with angiogenesis (new blood vessel formation).
- EGCG slows cancer spread by helping to block enzymes called matrix metalloproteinases (MMP's), which break down the healthy tissue to make space for cancerous tissue spread.

As we've already mentioned, focusing on test tube results is not the best way to tell if something helps in a real body in real life. That's why I'm very interested in live studies for EGCG.

In one study, EGCG was given to mice with tumors. After 5 weeks of orally-administered EGCG, the tumors shrank to about a third of the size they were before!

## How to Give EGCG to Your Dog

Please use EGCG under veterinary supervision.

I recommend the brand name supplement Teavigo for EGCG. It is a high purity (94%) tablet, and is fairly tasteless, where others are bitter and only about 30% pure. It can be found online or in nutritional stores such as GNC.

EGCG should be given on an empty stomach, between meals. This will enhance its absorption. If you need to split up capsules for small dogs, or if your dog is fussy about taking capsules, a very small amount of food can be used.

Please note: Do not give EGCG in combination with the brand name supplement Lutimax (discussed above). My studies with dogs show that one of the other ingredients (quercetin) in Lutimax could cause complications when combined with EGCG.

Give your dog 2-3 mg per pound of body weight every day. This can be split into two doses, as needed. You can follow these guidelines for your dog (dosing is based on Teavigo supplement):

- Miniature breeds up to 10 pounds: Empty a 150 mg capsule and divide it into 4 piles of powder, then give one of the piles with a very small amount of food, once per day (one capsule should last you 4 days).
- Small breeds, 10-25 pounds: Empty a 150 mg capsule, divide it into 2 piles, then give one of the piles with a very small amount of food once, per day (one capsule should last 2 days).
- Breeds 25-49 pounds: Give one 150 mg capsule, once per day.
- Breeds 50-100 pounds: Alternate 1 or 2 doses every day. The first day give one 150 mg capsule two times per day, the second day give one 150 mg capsule once per day, the third day give one 150 mg capsule two times per day, and so on.
- Breeds over 100 pounds: give one 150 mg capsule, two times daily.

## Precautions

Do not purchase green tea extracts that may contain caffeine or other stimulants. Depending on the content, these can be harmful to your dog. Use only pure EGCG extracts.

One report claims green tea supplements (though not specifically EGCG) may block the absorption of iron in the diet if taken with food. To be safe, give your dog EGCG between meals, on an empty stomach.

Like any dietary supplement, EGCG is capable of causing stomach upset. Discontinue use if you notice these or other effects.

There is a paper in circulation that says a group of beagle dogs were killed by incredibly massive amounts of EGCG. The reported doses were over 200 times the recommended amount, given every day for 13 weeks. I found this paper horrible and was seriously disturbed by it.

Anything given in such high doses, even water or a multivitamin, could have fatal effects. EGCG is a relatively safe supplement as long as you follow dosing instructions.

## Artemisinin

Artemisinin is a compound extracted from a plant commonly found in China, called Qing Hao. The plant is in the wormwood family, and for centuries has been used by Chinese doctors as an anti-malarial and fever treatment. It has recently attracted Western interest for use in cancer treatment.

Artemisinin is believed most helpful in treating dogs with osteosarcoma, but it is likely beneficial in other types of cancer as well.

### How Does Artemisinin Work?

Artemisinin interacts with iron and creates free radicals. Cancer cells love iron. They need a lot of iron to continue to divide as fast as they do. They are always bringing more iron in from other places in the body, in order to help with cell division.

Cancer cells bring the iron in through special gates in their outer membranes, used just to import iron. However, artemisinin can also enter the cancer cells through these gates, without the cancer detecting it.

Once inside, it reacts with the iron to form free radicals, which then destroy the cancer cells from the inside out.

Normal, healthy cells do not take up much iron at all, so they are resistant to the effects of artemisinin.

### How to Give Artemisinin to Your Dog

Please use artemisinin under veterinary supervision.

The absorption of artemisinin stops after a week of dosing. Give it for 5 days, then stop for 5 days, and repeat this 10 day cycle throughout the course of treatment.

Give about 10 mg per pound of body weight daily. For instance, if you have a 25 pound dog, you would give 250 mg per day.

A fatty oil like krill or fish oil will help the artemisinin be absorbed. Your vet may be able to get artemisinin in injection or suppository forms, which may increase the absorption rates. Check with your vet about dosing for your dog depending upon how you give the supplement.

## Precautions

I recommend discussing artemisinin with your vet.

You may want to add iron to the diet to increase artemisinin's effectiveness. However, this can be tricky, because if you give it at the same time as iron (for instance with a meal that has meat or supplements with iron) the artemisinin can interact with the iron before it gets to the cancer cells. So you might want to boost iron in your dog's diet, but give the artemisinin separately.

It is vital to get blood work to monitor your dog's iron levels before and after adding iron to the diet and artemisinin use.

Rarely, liver marker elevation and suppression of blood cells has been seen in humans using artemisinin.

There is a possibility that antioxidants and multivitamins may decrease artemisinin effectiveness, so you may need to stop their use.

Also stop supplementing with Co-Q 10, Cordyceps, indole-3-carbinol, and melatonin before using artemisinin. Berries should also be eliminated from the diet.

Do not use artemisinin when your dog is getting radiation treatments.

Artemisinin can possibly be used with most chemotherapy agents, but all interactions have not yet been assessed, so please check those out before beginning to supplement.

Do not use artemisinin if your dog has a seizure disorder or other brain problems, as it may lessen the effectiveness of some seizure control drugs.

There are some other possible effects seen in humans, such as cramping, stomach upset, and fevers.

## Be Careful with These Big Guns

The supplements we just went over are potentially very powerful anti-cancer agents. I am terribly excited about their application to dog cancer care. However, I want to be very clear that I do not recommend using any of these without veterinarian supervision.

The whole point of using these supplements is to give your dog another option beyond chemotherapy, radiation, and surgery; to kill cancer with natural, food-grade, plant-based supplements so that your dog feels better, not worse.

Some side effects are inevitable, of course, whenever you treat a disease. But I don't believe that dogs should feel sicker from the treatments than they do from the disease.

While we focus on cancer cell death with these supplements, let's also work on the other half of cancer combat—stopping its spread. The next chapter goes into great detail about how to make sure your dog is getting all the support she needs to stop the cancer from metastasizing.

Turn the page now to keep reading about the importance of stress relief and sleep when it comes to fighting cancer with your Full Spectrum Plan.

# Apocaps

I am at work developing a pill called Apocaps, regulated by the FDA under the medical food designation.

The ingredients in Apocaps, some of which have just been discussed, have been shown to improve the metabolic derangements caused by cancer—preserving the body’s nutritional resources and preventing cancer cells from being able to utilize these energy sources.

As a result, the body’s normal energy sources and reserves are preserved, while cancer cells are effectively starved.

Apocaps uses a patented bio-availability enhancer to improve absorption when taken by mouth.

Apocaps is used under veterinary supervision.

# Chapter Twenty-Two: Full Spectrum Cancer Care Step Four—Prevent Cancer Spread

We know there are agents to help attack tumors in the body that have already developed. That's great news.

But what about the cancer spread, or metastasis? What about those tiny micrometastases—the little cancer cells that are waiting to spring up into full blown tumors at a later date?

Let's take care of those, too, by boosting the immune system so it can take care of them. Here are six main steps.

- High-quality sleep
- Maintenance dosing of multivitamins
- Other supplements, including branched chain amino acids, modified citrus pectin, and doxycycline
- Sunlight (in most cases)
- Mushroom-derived polysaccharides
- Reduce stress and depression

## Sleep, for Melatonin's Sake

Your mother probably told you to go to bed early when you were sick. That's good advice. It is also good advice for your dog.

Your dog should get at least nine hours of sleep in total darkness. Why?

It's because total darkness is required to increase production of melatonin, the powerful hormone that boosts the immune system. You probably remember from earlier chapters that unnatural sleep/wake cycles are a cause of cancer because they interrupt melatonin production.

Melatonin is produced by the pineal gland, which is located in the center of the brain. The pineal gland goes to work when it's dark, but stops in the presence of light, especially blue light. Most people do not realize that the light from television screens, nightlights, and cell phone screens is primarily blue. So even when you have the lights off, if you are watching television at night in a dark room, you are still interfering with melatonin production.

Melatonin's relation to cancer was discussed in the *Journal of the National Cancer Institute*. A study was done on the breast cancer rates of women who are up late at night, in this case nurses working overnight shifts. It was found that these women had much less melatonin than normal, due to their irregular sleep patterns, and their breast cancer rates were about twice that of women who kept a consistent sleep schedule.

Given these facts, it makes sense to try to allow our dogs about nine hours of sleep in total darkness. I recommend nine hours because that is about the length of time it is naturally dark outside in most locations.

Most veterinarians do not talk much about the anti-cancer effect of melatonin, or think about the sleep patterns of dogs, but I want you to start thinking about it.

We want to encourage high melatonin levels in your dog's body to achieve the benefit of this natural cancer-fighting hormone. So please, make sure your dog has total darkness when he sleeps, for at least nine hours. If your dog sleeps in a room that is typically lighted, you might want to put their bed in a crate and drape a dark cloth over it to create a "cave."

## Maintenance Does of Multivitamins

We've already discussed the importance of maintenance vitamins to boost the immune system. For this reason, I encourage you to give your dog a good, balanced, daily multivitamin made specifically for dogs. We simply want approximate daily requirement levels.

Make sure you give your dog his or her vitamins with food, to help the vitamins get absorbed into the bloodstream. I also recommend you add some virgin fresh-pressed coconut oil to the meal for optimal absorption of the fat-soluble vitamins. Besides tasting great, coconut oil has many benefits including high energy content, balancing effects on blood fat levels, and natural infection-fighting compounds.

If you cannot give virgin fresh-pressed coconut oil, give krill oil, fish oil, or flax oil with the multivitamin. Unless you give some sort of fat with the vitamin, absorption of fat-soluble vitamins D, E, A, and K is compromised.

I go into detail about oils in the next section on the Full Spectrum Cancer Care diet, and also more detail about how to incorporate vitamins into meals.

You probably remember the devastating pet food scare of early 2008, when thousands of dogs and cats died due to contaminants in pet foods. I am very concerned about the safety of commercial pet foods and pet vitamins, so I have a recommendation for you. When it comes to selecting a multivitamin, I avoid the brand Pet Tabs, distributed by VIRBAC Animal Health, Inc. In a recent study conducted by an independent supplement analysis company, Consumer Labs, this brand was found to have high lead contamination.

## How to Give Multivitamins to Your Dog

Follow the labeled instructions on your pet vitamin.

## Precautions

Like any dietary supplement, vitamins are capable of causing stomach upset including vomiting or diarrhea. Discontinue use if you note these or other effects.

## Branched Chain Amino Acids

Protein makes up the body's muscles, enzymes, connective tissue, neurotransmitters, and more. Amino acids are the building blocks of proteins.

Certain amino acids also assist in healthy metabolism, the process by which the body gets energy. Amino acids are capable of slowing the weight loss that often occurs in cancer patients. They can also slow the spreading of cancers.

Three amino acids are the key players in cancer treatment: Glycine, arginine and HMB (beta-hydroxy-beta-methylbutyrate). They help the body maintain health by slowing cancer cachexia (weight loss), preventing cancer cell growth, and promoting protein building.

The *American Journal of Surgery* discussed a study in which a group of cancer patients received supplemental levels of these three amino acids. The control group of cancer patients received no such supplements. At the end of 4 weeks, the patients who were given the amino acids had gained a little over a pound, and the patients who were not given amino acids had lost about half a pound.

Branched chain amino acids can really help your dog's tissues stay healthy during cancer treatments.

### How Do Branched Amino Acids Work?

Glycine is especially useful in the fight against cancer because it slows the angiogenesis of tumors. Remember, angiogenesis is the process by which tumors cause the body to grow blood vessels. The cancerous tumors feed off of these blood vessels, starving the body of nutrition. These new blood vessels can also ferry cancer cells into the blood circulation, like little rivers draining into big rivers. This sets up metastasis, the distant spread of cancers to totally new locations in the body.

Glycine is able to slow angiogenesis because it blocks the effect of a chemical signal called VEGF (Vascular Endothelial Growth Factor). VEGF causes the body's blood vessels to sprout and branch towards tumors. In blocking this chemical, glycine helps to effectively prevent tumor growth.

Glycine has also been proven to limit the levels of toxic injury related to chemotherapy, particularly the kidney damage that can be seen with cisplatin use.

Meanwhile, Arginine and HMB are believed to boost the immune system, and have been shown to limit metastasis and tumor growth in mice.

Some scientists worry that amino acids might actually make cancers grow, because cancers can turn amino acids into sugar, and cancer cells thrive on sugar.

If this was the case, amino acids would make the cancer get worse, and there is no evidence that they do so. In fact, the opposite is true.

A study on the effects of the amino acid glutamine was published in the *Journal of Parenteral Enteral Nutrition*. The study concluded that the glutamine managed to prevent weight loss by building muscle, while the tumor structure remained the same. Therefore, supplementing with these amino acids was proven both safe and effective for cancer treatment. (If your dog has a brain tumor, do not use glutamine.)

### How to Give Amino Acids to Your Dog:

A good over-the-counter amino acid supplement called Juven is available in stores and online at [www.juven.com](http://www.juven.com). Juven contains the amino acids arginine, glycine, and HMB. It is sold as a powder that you mix with water and drink, but for dogs you can also mix it with cottage cheese, yogurt, or a little low-sugar ice cream. Here are my recommendations for dosing using packets of Juven.

Miniature breeds: ¼ packet

Small dogs, 35 pounds or less: ½ packet

Dogs 36-60 pounds: 1 packet

Dogs over 60 pounds: 2 packets

### Precautions:

The branched chain amino acids discussed here do not have any serious side effects. Other types of amino acids may alter neurotransmitter balances in the brain, but not the ones discussed in this section. These are common food components and are considered very safe. However, as with any supplement, dietary intolerance including vomiting and diarrhea is a possibility in certain dogs.

One exception: do not use supplements containing glutamine if your dog has brain cancer. Glutamine has been shown to worsen brain cancer by accelerating its growth. Please check with your vet before starting use of glutamine, to ensure there is no risk of brain cancer or other issues.

## Modified Citrus Pectin

Modified citrus pectin (MCP) is a natural compound found in apples, plums, and the peels of citrus fruit. Citrus pectin is used as a thickening agent in cooking, and *modified* citrus pectin has been altered slightly to allow the body to absorb it more efficiently.

### How Does MCP Work?

MCP binds to the outside of cancer cells, helping to block them from attaching to surrounding blood vessels. MCP also reduces the number of blood vessel branches produced in the first place. Fewer blood vessels branching to tumors mean less nutrition for them, less growth, and less metastasis.

A study published in the *Journal of the National Cancer Institute* showed that when mice with cancer were fed MCP, it reduced tumor growth, metastasis, and angiogenesis.

### How to Give MCP to Your Dog:

Modified citrus pectin should be given with food. It comes in a gel capsule and in a powdered capsule form.

#### Capsules:

For dogs 35 pounds or under, the capsule may have to be opened and divided. Mix the appropriate amount in with your dog's meal.

Miniature breeds:  $\frac{1}{4}$  of an 800 mg capsule, daily

Small dogs up to 35 pounds:  $\frac{1}{2}$  of an 800 mg capsule, daily

36-60 pounds: 800 mg, once daily

Over 60 lbs: 800 mg, two times daily

#### Powder:

For dogs 35 pounds or under, the pile of powder may have to be separated into halves or quarters.

Miniature breeds:  $\frac{1}{2}$  gram of powder, daily

Small dogs up to 35 pounds: 1 gram of powder, daily

36-60 pounds: 2 grams of powder, daily

Over 60 pounds: 4 grams of powder, daily

As it gets wet, the powder will turn into a jam-like gel. Don't be concerned if this happens when you mix the powder with the food.

### Precautions:

Modified citrus pectin is considered a food product, and is classified by the FDA as GRAS (Generally Regarded As Safe). Side effects are very rare.

There are cases of workers in factories developing asthma due to inhaling citrus pectin, but this should certainly not be an issue in your dog, since you are mixing it into their food and it will not go into their lungs.

Like any dietary supplement, modified citrus pectin is capable of causing stomach upset such as vomiting and diarrhea. Discontinue use if you notice these or other effects.

## Doxycycline

Historically, doxycycline has been used as an antibiotic. In the last decade or so it has also been studied for its effects against cancer. Its anti-cancer effects have nothing to do with its ability to help fight infection, and many vets do not know about the drug for cancer treatment use.

If you were to bring up the use of doxycycline to your vet, you may find him or her skeptical, since information about the drug as a cancer-fighting agent is not as widespread as it should be.

However, since this medication is a prescription drug, you will need your vet's help to get it. If he or she seems hesitant, you may have to stand your ground a bit. Share the following information with your vet.

### How Does Doxycycline Work?

Doxycycline helps suppress angiogenesis (new blood vessel formation that feeds tumors). In this way, it helps to slow tumor growth. With limited access to a blood supply, the cancer cells are less able to metastasize through the circulation. In the lab, doxycycline has also been seen to induce apoptosis (healthy, programmed death) of cancer cells.

Doxycycline is also able to suppress the ability of matrix metalloproteinases (MMPs). MMPs are enzymes sent out by tumor cells to break down normal body tissue, thereby making space for the advancing cancer cells to spread into the body. When MMPs can't do their job, cancer can't spread as easily.

In lab studies using mice, doxycycline was shown to cut tumors down by about one-third.

Not bad for a drug that was made for a totally different purpose!

## How to Give Doxycycline to Your Dog

Use doxycycline under veterinary supervision.

You should give 5 mg of doxycycline per kilogram of body weight daily, which is about 25 mg per 10 pounds of weight. For example, a dog that weighs 40 pounds should get about 100 mg daily. I usually advise giving it with food to avoid digestive upset.

In my opinion, doxycycline should be stopped after a two-week cycle. Before returning to it, you should try a different technique to decrease cancer spread. There is a reason for using it so carefully and sparingly. Since doxycycline is an antibiotic, the germs in the body may become resistant to it, increasing the odds that later infections will be tougher to cure.

## Precautions

The most common side effect is digestive upset (vomiting, diarrhea, and loss of appetite), especially when given on an empty stomach.

Doxycycline should not be given to pregnant or nursing animals. It can cause birth defects and be carried in the milk of a dog who is nursing pups.

Rarely, doxycycline can cause yellowing of the baby teeth in young dogs.

It should not be given with antacids or with Pepto Bismol, because these medications block absorption of doxycycline. Give at least 2 hours before or after antacids or Pepto Bismol.

High calcium meals decrease doxycycline's absorption, so avoid cottage cheese, bones, bone meal, and similar foods when giving doxycycline.

## Get Your Dog Some Sun!

In the old days, sunlight was thought to worsen cancer. This belief has been proven false in the case of all but two canine cancers—squamous cell carcinoma and hemangiosarcoma of the skin.

The sun is actually good for dogs with cancer! This not only holds true for prevention, but also as an actual treatment after cancer starts.

The link is vitamin D, as proven in the *Journal of Cancer Research and Therapeutics*. The body makes natural vitamin D as a hormone, in response to sunlight (UVB rays especially). This hormonal form of vitamin D has much stronger effects than the supplemental form taken by mouth or found in fortified milk.

The hormonal form of vitamin D attaches to the outside of cancer cells. Once attached, it has effects against angiogenesis, slows cancer cell division, and reduces metastasis. The more sun exposure, the less cancer found in the body. This was shown for thirteen different types of cancers in humans.

Current recommendations for humans with light skin is 10-30 minutes of sun per day, while those with dark skin may need up to several hours. It would seem logical that the same is true for dogs. Dogs have different skin colors, and the color of the coat is usually the same as the skin underneath.

Be careful not to overheat your dog. Dogs kept out in the sun for more than 15-30 minutes, in temperatures 75 degrees or higher, should have their coats clipped short. Dogs with short muzzles, such as Bulldogs, Pugs, and Boxers, are also susceptible to heat stroke. To be safe, I do not recommend being out in direct sun for more than a few minutes if the temperature is above 85 degrees, regardless of breed.

If natural sunlight is not available, or if it is too hot out, there are other ways to increase vitamin D levels in your dog. You can use a UVB lamp, the same as the kind used to treat depression in countries without a lot of sunlight.

I do not recommend supplementing with oral vitamin D, because the blood levels achieved by oral dosing are too low to be effective.

## Mushroom-Derived Polysaccharides

Before beginning my research into cancer, I had never heard of mushrooms for use as an immune stimulator. When I came across this information in scientific literature, I thought it was totally bizarre.

Then I remembered that penicillin—maybe the biggest advance in medicinal history— was created from a fungus. Maybe the use of mushrooms isn't so weird after all.

An article published in the *Journal of Medicinal Food* pretty much summed up the benefits of mushrooms. It said that mushrooms were found to limit both metastasis and the presence of tumors, as well as increase the activity of NK cells (white blood cells involved in destroying cancer cells).

The Guangdong Pharmaceutical University at the School of Chinese Medicine also did a study to determine mushrooms' effect on tumors in mice. The researchers found that the mushrooms showed a clear anti-tumor effect as well as positive effects on the immune system.

Not bad for a fungus.

### How Do These Mushrooms Work?

Mushrooms contain compounds called polysaccharides, which are a kind of carbohydrate. It turns out that these polysaccharides act like a natural “on” switch for white blood cells involved in destroying cancers.

One of these polysaccharides is beta-glucan. Beta-glucan binds to the outside of immune system cells, which activates them, increasing their activity and responsiveness. Beta-glucan is absorbed into the body through the cells that line the intestine. Once your dog swallows the beta-glucans, the active agents are well on their way to revving up the immune system.

Mushrooms have other helpful, documented effects on cancer cells:

- They cause cell cycle arrest, which slows down cancer cell multiplication.
- They induce apoptosis (programmed, healthy cell death)
- They are anti-angiogenetic, or interfere with the growth of new blood vessels in cancer cells.

Many mushrooms contain beta-glucan and other immune boosting polysaccharides, but the ones with the most proof of effectiveness in cancer treatment are maitake, shitake, phellinus linteus, and agaricus blazei.

## How to Give Mushrooms to Your Dog

Please use mushroom-derived polysaccharides under veterinary supervision.

You can feed your dog mushrooms, but getting the proper dosage is hard to guarantee. With my patients and my own dog, I use a supplement called K-9 Immunity. It is engineered specifically for dogs, and uses an enzyme called bromelain. Bromelain helps the beta-glucan get absorbed into the body's circulation quicker and more efficiently.

You can grind up the pills into a powder and mix them into your dog's food. K-9 Immunity has specific dosing instructions on the label.

## Precautions

Since these mushrooms stimulate immunity, they should be avoided if your dog has a disease that is caused by an over-active immune system (an "immune-mediated" disease). If you are not sure about this, ask your vet.

Diabetic dogs may require less insulin when taking mushroom derived-supplements. If your dog has diabetes, use mushrooms with caution and check insulin levels to make sure your dog still needs the same amount.

These mushrooms can occasionally cause digestive upset, such as diarrhea and vomiting.

As always, consult with your veterinarian.

## Treat Stress and Depression

There is solid data in human medicine that people who are lonely, lack support, and have low self-esteem are more prone to cancer.

I believe the same is true for dogs.

Like people, dogs need a release for their emotions, a supportive social network, and a positive self-image.

There is an entire scientific field devoted to the link between the brain, mental state, and the body. This field is called psychoneuroimmunology. It is not “mumbo jumbo.” It is real, measurable, hard data.

A paper published in the *Journal of Community Health* explored the link between emotions and breast cancer in women, which gives us a lot of insight into how stress and depression can affect cancer.

The researchers surveyed 826 women with cancer about their levels of loneliness, marital contentment, life changes and emotional repression. The results of these surveys were ranked from most depressed to least depressed, and then compared to the severity of the women’s cancers.

When the results were examined, the researchers concluded that the more repressed these women’s emotions were, the more cancer they had. The same held true for loneliness—the lonelier the women were, the more cancer they had.

*The Lancet Oncology* also published an article about the correlation between mental state and illness, stating that stress and depression lower cytotoxic T-cell and natural killer cell activities, as well as suppressing the immune system’s ability to find and kill cancer cells. Both of these effects weaken the body’s ability to fight cancer.

To my knowledge, this perspective has not been applied to dogs fighting cancer. However, since dogs’ physiology is in many ways the same as humans’, it can’t hurt to boost self-esteem and social support.

## Overcoming Negative Emotions and Stimulating Positive Emotions

Many negative mental states can weaken dogs' ability to fight cancer:

- Depression
- Loneliness
- Repressed emotions (lack of outlet)
- Low self-esteem
- Stress

Emotionally, dogs function much like we do. If we can help our dogs eliminate unhealthy emotions, we are that much further ahead in the fight

against cancer. The body will respond with less cancer cell growth and more immune system destruction of cancer cells.

To create emotions that fight cancer, dogs need:

- Healthy stimulation to overcome depression
- To be social, to help fight loneliness
- To overcome gentle challenges, which builds self-esteem
- To have outlets, usually physical activity, to reduce stress

Dogs are pack animals. Out in the wild, they have social relationships, physical activities and exercise, and they are challenged with the job of surviving. If we can—gently—create similar situations that meet these natural needs, we will do our dogs a huge service. They will feel a hundred times better, and their bodies will also be more apt to fight the cancer.

So how can we create those situations? Healthy stimulation and overcoming challenges happen during training. Dogs like to have jobs or tasks to complete, just like people do. I am not talking about a full-fledged training program, since many dogs with cancer are not able to perform at this level. Rather, just being faced with simple challenges and receiving a reward for doing a good job is a way to create this effect. Asking your dog to sit, stay, come, speak, shake, fetch, or roll over are all examples of simple tasks.

You might want to read a good book to learn low-key ways to train dogs without causing stress. Personally, I recommend Tamar Gellar's book, *The Loved Dog*.

When they are able to approach something that is a little challenging, overcome that challenge, and receive a reward, dogs thrive.

Help your dog overcome loneliness by scheduling play dates with other dogs. Try to match the traits of the dogs. If you have a slow old-timer, don't arrange a meeting with a large, athletic German Shepherd. Make sure your dog is able to hold her own without getting intimidated, overwhelmed, or physically overpowered.

If your dog does not do well with other dogs, find times to get together with other people. This can include playtime, walks, or simply sitting and loving. Just like humans, dogs really benefits from interaction with others.

This leads to the next main way to help create a cancer-fighting mindset in your dog: regular physical release. This means burning off steam in ways in which your dog is capable.

Ways for dogs to burn off steam:

- Walking
- Jogging
- Sprinting
- Chasing
- Playing with toys (with you leading in the play)
- Wrestling
- Fetching
- Climbing stairs
- Speaking (barking or yowling)

Now, of course not all dogs with cancer can do all of these things. Often, though, they can do a version of at least one. The idea is not to create a track star, but to provide regular, consistent, daily outlets for discharge of emotion and energy. Allowing your dog to burn off steam will almost always involve physical activity.

If you can be physically outside in the sunshine, it's even better. As previously discussed, sunlight creates production of a potent, active, hormonal form of vitamin D that fights cancer.

Try to schedule something at least 2 to 3 times a day. Consistency is key!

We'll cover more strategies for improving your dog's moods in a later chapter. But for now, let's think about the fifth step in the Full Spectrum Cancer Care Plan...eating a great, healthy, yummy diet!

## Chapter Twenty-Three: Full Spectrum Cancer Care Step Five—Cancer Diet and Exercise

A good diet and regular physical exercise are not only essential to good health. They are what your dog's body craves naturally. All dogs thrive on tasty, healthy food, and at least a little movement.

If your dog has cancer, it is even more important to get them on a plan. Weight loss and physical weakness are serious side effects of cancer, and of many cancer treatments. You can remedy these with a diet rich in fatty acids, enzymes, and densely nutritious foods.

Most dogs will eat unless they are seriously ill or nauseous. Here's a little crash course in good eating for dogs.

We'll start out with a discussion of supplements we have not yet covered in earlier chapters, then move on to actual recipes and a plan for your dog.

### Add Fatty Acid Plan: Krill or Fish Oil

You probably remember the in-depth discussion on fatty acids in the chapter on cancer causes.

To review, omega-3 fatty acids boost the immune system, and are needed to offset excess levels of omega-6 fatty acids, which suppress the immune system.

Omega-6 is found in corn, corn oil, and grain-fed meats, all of which make up a big portion of commercial dog food ingredients. Dogs and people

alike ingest way too much omega-6, so an omega-3 supplement is crucial to maintain a healthy immune system.

Omega-3 fatty acids also protect against cancer cachexia, the weight loss often seen in advanced cancer cases. According to one study, long-term EPA (an omega-3 fatty acid found in krill and fish oils) supplementation can prevent weight loss and shrink tumors.

So the first step in building a cancer diet is to make sure your dog gets enough good fatty acids.

There are two main types of fatty acids I recommend adding to your dog's diet—krill oil and fish oil. Pick one, use it for 3 to 4 weeks, and then switch to the other, alternating oils throughout the treatment.

Let's start with my favorite fatty acid source, krill oil.

## Krill Oil

Krill are tiny shrimp that are the primary source of food for whales. Humans harvest krill to produce nutrient-rich oil with some really incredible health effects.

First, krill oil has high amounts of EPA and DHA, which are both omega-3 fatty acids.

In addition to the regular activities of a fatty acid, EPA also directly interferes with cancer cells that try to break down muscles.

Cancer cells actually signal healthy muscle cells to break down and release their amino acids so that the cancer cells can feed on them. They literally trick the body into turning itself into a cafeteria for the cancer. EPA helps to block these signals to the muscles, so they never get the message and stay healthy and normal.

In addition, EPA can prevent cancer from feeding off the body's fat stores. This serves to slow tumor growth and limit cancer cachexia.

A study published in the *International Journal of Clinical Practice* showed that krill oil is also helpful for depression. As we've discovered, depression has been clinically shown to worsen cancers and hinder recovery.

Krill oil contains phospholipids, which the body uses to help build nerve tissue. In the study, brain scans were taken before and after supplementation with krill oil. Looking at these scans drives the point home for me. The changes in the brain are measurable; you can literally see the difference.

As fish age, they tend to accumulate heavy metals like lead in their fatty tissue. Some of these metals are carcinogens, which we know is something we want to avoid. This is why I like krill oil as a fatty acid supplement—because it is so low in the food chain, krill doesn't contain the levels of heavy metal that are found some fish oil products.

## How to Give Krill Oil to Your Dog

Krill oil typically comes in 1000 mg softgel capsules. If you have 500 mg capsules instead, simply double the dose I list below. Just open the capsules and mix them into food. Better, if your dog can swallow them whole, do that.

Miniature Breeds: 1-2 1000 mg capsules, daily

Small dogs up to 35 pounds: 3-4 1000 mg capsules, daily

Dogs 36-60 pounds: 6-9 1000 mg capsules, daily

Over 60 pounds: 10-12 1000 mg capsules, daily

Don't start out with these doses at first, because the sudden introduction of fatty acids can cause stomach upset and diarrhea. Instead, work your way up to them over about 14 days. If you have a miniature breed, give 1 capsule every other day to start with.

## Precautions

There may be some blood thinning effects with krill oil, so stop 10 days before any surgery and wait to continue until sutures are removed. Digestive upset such as vomiting and diarrhea are possible with any product taken by mouth.

Also, allergic reactions to shellfish or fish are rare but possible. Immediately stop use and consult your vet if you think your dog is having an allergic reaction.

## Fish Oil

The effects of fish oil are similar to those of krill oil, but fish oil has less effect on depression because it lacks the nerve-building phospholipid content of krill oil. You also need to make sure the fish oil is heavy metal-free.

You're probably thinking, "In that case, why bother with fish oil?"

One reason is cost. Fish oil can be cheaper than krill oil, and on top of the other expenses of cancer treatment, this may be important to some dog owners. Another reason for using fish oil is ease and convenience. Krill oil sometimes needs to be special ordered, while fish oil is readily available at most large food stores.

Heavy metals and phospholipids aside, the overall omega-3 effect of both supplements is very similar.

### How to Give Fish Oil to Your Dog

When outlining these doses, I assume each 1000 mg soft gel contains 180 mg of EPA and 120 mg of DHA. If you have a double strength formulation, which should be indicated on the label, give half the number of capsules.

Miniature breeds: 1-2 capsules, daily

Small dogs up to 35 pounds: 3- 4 capsules, daily

Dogs 36-60 pounds: 6-9 capsules, daily

Over 60 pounds: 10-12 capsules, daily

### Precautions

As with krill oil, fish oil may cause some blood thinning effects, so stop 10 days before any surgery, and wait until sutures are removed to continue.

Digestive upset such as vomiting and diarrhea are possible with any product taken by mouth.

Do not use cod liver oil as your fish oil supplement. Cod liver oil contains abnormally high levels of fat-soluble vitamins, ingestion of which can lead to serious toxicity levels.

I also discourage using salmon oil from the name brand EHP. In an independent analysis, Consumer Labs found that EHP's salmon oil actually contains less EPA than stated on the label. Since EPA is such an important source of omega-3, there's no excuse to skimp. Other brands of salmon oil are fine to use.

## Add Digestive Enzymes

Digestive enzymes break down food so that it can be better used by the body. Some enzymes actually pre-digest food. Others help the body absorb nutrients, especially the nutrients found in fruits and vegetables.

Dogs have a hard time digesting vegetables and fruit. This is partially because dogs have short digestive tracts, so the food doesn't actually have enough time to break down as much as is necessary. Dogs also lack the digestive enzymes needed to break down plant material, because in the wild they ate already-digested plants from the bellies of their prey.

If your dog cannot digest something, he does not get the full benefit. That is why enzymes are important to supplement, especially during a battle with cancer where every supplement and treatment is crucial.

Enzymes like trypsin, trypsinogen, pancrezyme, amylase, cellulase and lipase can all be beneficial during cancer treatments. When you purchase them, you will often find them all together in the same product, and often combined with healthy bacteria like lactobacillus and bifidobacteria.

But proper digestion is not the only reason to add enzymes to your dog's diet. They can also have a clear effect on cancer.

We'll go over that in a minute. But first, let's focus on digestive enzymes' primary purpose: digestion.

### Using Digestive Enzymes to Pre-Digest Your Dog's Food

I want to teach you how to pre-digest your dog's food, so they can get the full health benefits from it.

One popular digestive enzyme for pets is made by Dr. Goodpet, which you can order online at [www.goodpet.com](http://www.goodpet.com). You can also use Wobenzym N, a popular European brand that can also be found online.

Enzymes are very reactive to heat, so if you want to pre-digest your dog's food make sure it is room temperature or cooler. Mix the enzymes into the food, making sure there is a little moisture present to get the digestive process started. Also make sure the enzymes are spread evenly.

Let the meal/enzyme mixture sit for at least half an hour while the enzymes go to work. By the time you put the bowl in front of your dog, the enzymes will have partially digested the food.

Digestive enzymes are sold assuming you will take them on an empty stomach. When we mix these digestive enzymes into food, we need to use much larger doses than are labeled for over-the-counter use. I recommend using twice the recommended dose if you are also using the enzyme Wobenzym-N. If you are using Dr. Goodpet or another enzyme mix, use about three times the labeled dose to help pre-digest your dog's food.

## Precautions

Very few side effects have been documented when using digestive enzymes to pre-digest food. However, digestive upset such as diarrhea is possible with any supplement taken by mouth. Stop digestive enzymes in food 10 days before surgery, and do not resume until the sutures are removed.

## Using Digestive Enzymes to Support Your Dog's Digestion

Pre-digesting food is only one use for these enzymes.

If you feed your dog digestive enzymes on an empty stomach, without food, some will pass directly into the bloodstream and remain active. Once they are in the bloodstream, the pancreas can recollect and reuse them in the future. This allows the pancreas—which is always burdened during illness—to store up digestive enzymes instead of working hard to make more. It is the ultimate form of bodily recycling.

There is a belief in the conventional medical community that such enzymes are broken down in the digestive tract and made useless, but this is not the case. Plant-based enzymes are actually fairly stable in the acidic environment of the digestive system.

## Using Digestive Enzymes as an Anti-Cancer Supplement

There is a third reason to give enzymes to your dog.

Several studies have shown that oral enzymes have beneficial effects on cancer patients. Enzymes help relieve the side effects of other treatments, improve survival times, decrease inflammation, and even shrink tumors.

Oral enzymes for these uses are very popular in Europe, especially Germany, but enzyme use is essentially ignored in conventional American veterinary medicine. I believe this oversight is a mistake.

In an article published in *Cancer Chemotherapy and Pharmacology*, a test group of breast cancer patients was given oral enzymes and a control group of patients was not. The researchers concluded that oral enzyme therapy “improves the quality of life by reducing signs and symptoms of the disease.” This included reduced side effects from radiation and chemotherapy. The enzymes also provided the potential for less recurrence and metastasis, as well as longer survival times.

Another study concentrating on enzyme use in patients with an advanced stage of multiple myeloma showed that while the control group’s average survival was 47 months, the patients who took oral enzymes for more than 6 months lived 83 months—that’s three years longer.

And according to *US Oncology News* magazine, a digestive enzyme called trypsin is actually able to damage the outside of cancer cells once it gets in the bloodstream.

### How to Give Enzymes to Your Dog

Give oral enzymes on empty stomach, at least 2 hours before or after a meal. Remember, we are not trying to digest food. Rather we want the enzymes themselves to have effects on the cancer in the body.

Give enzymes for 2 weeks on, then 2 weeks off.

Miniature breeds and small dogs under 35 pounds should receive ½ a capsule each day. To divide the capsule, open it up and split the power into two equal piles. Mix with water or a little broth, and give it by mouth with an eyedropper, a syringe, or a turkey baster.

Medium and large dogs between 36-60 pounds should receive 1 capsule daily. Dogs between 61-90 pounds should received 2 two capsules a day, and dogs over 90 pounds should received 3 capsules daily.

## Precautions

Watch for diarrhea, and stop if your dog experiences it. After a week, try again with a lower dose (give every other day instead of every day), or give it with a very tiny amount of food.

Stop oral enzyme use 10 days before surgery, as there is some evidence it may contribute to excessive bleeding in surgery. Resume use once the sutures are removed, 10 to 14 days after surgery.

## Supplement with Indole-3-carbinol

We've already discussed indole-3-carbinol for its protection against side effects of the chemotherapy drug cyclophosphamide. However, it also has some dietary benefits in cancer patients.

Indole-3-carbinol is derived from cruciferous vegetables, such as cabbage, broccoli, Brussels sprouts, and bok choy, all of which are known for their anti-cancer properties. When indole-3-carbinol reaches the stomach, it is converted into diindolylmethane. One of this agent's main effects is protecting against carcinogens, thus helping to block cancer formation.

You're probably thinking, "If indole-3-carbinol is most effective in *preventing* cancer, what is the logic of putting it in a book for dogs that already *have* cancer?"

### Indole-3-carbinol For Cancer Patients

New evidence has shown that indole-3-carbinol has caused apoptosis (healthy, normal, programmed death of cancer cells) in humans with cervical cancer. This has been proven in-vivo (in the living body), not just in test tube (in-vitro) studies.

This is big news, and makes indole-3-carbinol a serious contender for inclusion in a Full Spectrum Cancer Care.

## How to Give Indole-3-carbinol to Your Dog:

Use indole-3-carbinol under veterinary supervision only.

Give 15-25 mg per 10 pounds of your dog's body weight with food, daily. For example, if your dog weighs 50 pounds, give 750-1,250 mg each day.

### Precautions:

Do not use indole-3-carbinol in dogs that are to be used for breeding, as it has some anti-estrogen effects and may reduce fertility.

Indole-3-carbinol may also have blood thinning effects, so do not use it within 10 days of surgery. Resume use after the sutures are removed 10 to 14 days later.

Indole-3-carbinol may lessen the effects of chemotherapy or radiation by free-radical scavenging.

I feel the bone marrow protection effects may outweigh this negative, but you should discuss this with your vet before using indole-3-carbinol.

## Switching Your Dog to a Cancer Diet

If they are on regular commercial dog food, most dogs love the switch to a cancer diet. After all, it is mostly human food, and it tastes great.

However, if your dog is finicky, she may not love the switch.

Any change in diet should be started slowly, gradually phasing out the old food as you add in the new. Dogs can experience violent diarrhea, bloating, vomiting, and other problems if their food is changed suddenly. It is really best to be patient. I promise it will pay off.

The way to introduce these foods is over a long period, usually about 2 weeks. Monitor for diarrhea as you mix the new food in with the old food, very slowly increasing the amounts of new food and decreasing the old, tablespoon by tablespoon.

After a week, your dog's ration should be half the cancer diet and half the previous food. If diarrhea or vomiting occurs, back off and lessen the amount of the new food. Then try again in a few days.

As you go, you might find your dog does not like something in particular, and you might have to try out several different recipes before you can find something healthy that your dog likes.

Remember the most important thing: eating something is better than not eating at all.

If you have to choose between feeding your dog something that is not really “healthy”, and having your dog not eat at all, choose eating something not really “healthy.” Starving your dog is not going to help him.

In the following pages I make a lot of suggestions about feeding your dog. This cancer diet is all homemade food, not pre-packaged in any way.

If your dog has lymphosarcoma, there is one commercially-made diet that has been shown to help extend the life of dogs with this cancer. It is the best pre-made diet for cancer at this time. It is produced by Hill's, and is called ND. It is available by prescription only and, like all cancer diets, needs to be very gradually worked into the ration to avoid digestive upset.

In any other cases, here is what I recommend for your dog when you put him on a cancer diet.

## Pantry Items for the Dog Cancer Diet

These foods are all useful in constructing your dog's cancer diet. Many of these items, particularly the lean meats, can be purchased on sale and frozen for later use. In every meal, you will want to include food from each category below (a recipe follows).

### Food Category 1: Lean Meats, With the Fat Removed

Beef	Turkey	Pork
Chicken	Venison	Goat
Fish	Duck	Lamb

## Food Category 2: Fats and Oils

Krill oil

Fish oil (menhaden, mackerel, salmon, etc.)

Cooked Liver

## Food Category 3: Cooked Vegetables

Shitake  
mushrooms

Broccoli

Mung beans

Cauliflower

Red and yellow  
bell peppers

Brussels sprouts

Cabbage

## Food Category 4: Calcium

Chicken or turkey necks

Cottage cheese

Oyster shell calcium tablets

Cooked liver

## Food Category 5: Grains

Brown Rice

Oatmeal

## Optional Healthy Additions

Fresh garlic cloves, peeled and minced

Fresh ginger root, peeled and minced

Potassium Chloride (as a salt substitute)

## Optional Healthy Additions (continued)

Fresh leafy herbs like parsley, basil and oregano, minced

Virgin coconut oil

Sardines in oil

Goji berries (wolf berry)

Fresh blueberries

Fresh raspberries

Fresh blackberries

Digestive enzymes as described above

## Why You Should Avoid Most Common Grains

The foods on this list are dense in nutrients, packed with cancer-fighting properties, and exceptionally tasty for your dog. If you remember our earlier discussion about dog's original diets, you will notice that this is based on the concept of a dog's natural diet.

Notice, however, that there are no added sugars and very few grains on this list. That is not only because these foods are not in their natural diet.

It's also because these foods feed cancer, not your dog. Here's why:

Carbohydrates come in the form of sugars (simple carbohydrates) or starches (complex carbohydrates). Cancers prefer simple carbohydrates as their main fuel source.

The easier it is for a starch to be broken into simple sugars, the more the cancer will like it, because cancer likes to get food fast and with minimal work. (Think about how it steals blood vessels from neighboring cells and breaks down muscles for food, rather than waiting to be fed by the body).

In other words, cancer is a junk food junkie.

Very few dog lovers actually feed their dog pure sugar, but many feed their dogs carbohydrates without realizing it.

Corn or wheat is often the first ingredient found in commercial dog food. And even those owners who feed their dogs homemade food will often include carbohydrate-rich potatoes and carrots in their meals. Those foods almost instantly turn into simple sugars, making cancer cells happy and well-fed.

That's why, in general, I say to avoid carbohydrates and sugars. Whole grains can be given, especially if you are concerned about cost and want to give a tasty bulk to an otherwise all-meat-and-vegetable meal. Try very well-cooked, softened brown rice. The bran in the rice contains polysaccharides that have some evidence for cancer-fighting ability.

Oatmeal is another good option for a wholesome grain.

## Other Considerations

I have seen some dog cancer diets suggest tofu as a protein substitute, but I do not recommend this as a first choice, because dogs do not digest it very well.

Normal table salt (also known as sodium chloride) may promote cancer cell development, so it is important that you restrict sodium intake. Instead, you can use a salt substitute called potassium chloride, which gives the flavor of salt without aiding in cancer development. You can find this in most grocery stores.

Your dog will also benefit from a good source of calcium in food. Good sources of calcium include non-fat dairy products such as cottage cheese, bone meal (ground-up bones), and chicken or turkey necks.

As you have already read, a multivitamin should be given with meals so the fat soluble vitamins are taken into the body with maximum efficiency.

## An Anti-Cancer Recipe

This recipe provides at most 4 days of meals for a 50-pound dog who eats twice a day, give or take, depending on their activity levels and metabolism. For example, if your dog is very active, this may only last you two days. If your dog is not a big eater it could last you four days.

Scale portions up or down based on your dog's weight.<sup>3</sup> In other words, if your dog weighs 25 pounds, cut this recipe in half. If your dog weighs 100 pounds, double it.

Use my recommendations here or use ingredients from your pantry categories above to mix and match as you see fit until you find a combination that your dog enjoys.

### Food Ingredients:

- 2 ½ to 3 pounds of lean meat, well-cooked via browning in a nonstick pan or boiled. Use any combination from the Food Category 1 list above.
- 1 to 2 pounds of well-cooked, softened brown rice or oatmeal, Food Category 5
- ½ - ¾ pound vegetables, cooked and soft, from Food Category 3
- ½ - ⅔ pounds of cooked chopped liver (beef, chicken or pork), Food Category 2 and 4
- 1 to 1 ½ cups cottage cheese, Food Category 4
- 2 boiled skinless chicken necks, *or* 2 tablespoons bone meal, Food Category 4

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<sup>3</sup> Speaking of scales, a small, inexpensive kitchen scale is worth its weight in gold. It will help portion out some of the supplements and dietary suggestions I mention throughout this book.

- $\frac{3}{4}$  teaspoon potassium chloride (as a salt substitute), Optional Healthy Additions
- 4-5 grams total<sup>4</sup> oyster shell calcium tablets, Food Category 4
- 16-18 of the 1,000 mg fatty acid capsules listed above\*, Food Category 2

#### Healthy Optional Additions Can Include:

- 4-5 cloves minced garlic\*
- 4-5 teaspoons minced fresh ginger root\*
- 1-3 teaspoons minced berries
- 1-2 tablespoons coconut oil
- 2-4 teaspoons minced fresh leafy herbs
- 1-2 chopped sardines in oil
- Digestive enzymes<sup>\*5</sup>

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<sup>4</sup> If you are using the oyster shell calcium, do not give the anti-cancer supplement doxycycline within 2 hours of the meal. The calcium will bind the doxycycline in the stomach and block its absorption. Give doxycycline later. For more information on doxycycline see Chapter Twenty-Two.

\* May have blood-thinning effects. Do not give within 10 days of surgery or until after sutures have been removed.

<sup>5</sup> Remember, you are making 4-8 meals' worth of food, so you need to add much more than 1 serving of over-the-counter enzymes. I suggest adding a minimum of twice the labeled dose per meal. This means you will end up adding 8-16 times the recommended dose of enzymes to this large batch.

## Make the Base Mixture:

- Make a mixture of the cooked and chopped meats, liver, and chicken necks.
- Add cooked brown rice or oatmeal to meat mixture.
- Mix cooked and chopped vegetables into the meat mixture.
- In a separate bowl, mix together the cottage cheese, potassium chloride, fatty acids, and other healthy additions of your choosing. (Some dogs will eat the capsules of krill oil or fish oil whole, while others will need the capsules opened and emptied into the mixture.)
- In another bowl, grind up the calcium tablets. (A mortar and pestle or a pill grinder helps a lot). Add these to the cottage cheese mixture.
- Add the meat/rice/vegetable mixture to the cottage cheese mixture. Stir thoroughly.
- For more flavor, consider adding a splash of Bragg's Liquid Aminos (be very sparing—this is concentrated), balsamic vinegar, or the pan juice from the cooked meats. Tuna water works, too.
- Store entire mix in an airtight container in the refrigerator for up to 4 days. Apportion as needed, twice a day.
- Do not add any Optional Ingredients to the Base Mixture. It is better to wait until you serve the food.

## When It's Dinner Time

- Take your Base Mixture out of the refrigerator and dish out a portion based on your dog's weight and activity level, as discussed above.
- Add any and all of the supplements/treatments that can be given with food. This includes multivitamins, branched chain amino acids, modified citrus pectin, medicinal mushrooms (or K-9 Immunity), glutamine, Co Q-10, and/or Cordyceps. Grind tablets

into powders, and open any capsules and pour in the substance, unless your dog will swallow pills and capsules whole. Mix well.

- Add Healthy Optional Ingredients from the Pantry List above.
- If the food has heated for some reason, cool to room temperature or below, and then stir in the digestive enzymes. Mix very well.
- Allow the food to sit for at least 30 minutes to let enzymes work. Remember, even mild heat will destroy the enzymes, so refrigerate the food while the enzymes work if you are in a warm climate.
- Set the bowl in front of your dog and let him feast!

## Precautions

Do not give garlic, ginger, krill oil, fish oil, or digestive enzymes within 10 days of surgery. They may have a blood-thinning effect and cause bleeding problems.

If your dog has a pancreatic disease, consult with your veterinarian, as high fat in the diet may worsen such a condition.

## What if I Use Commercial Dog Food?

I realize this is pretty complicated, and can be a bit costly. As usual, I have presented the best option possible for those who want to come as close to perfect as possible.

You can also use a commercial dog food as a base for this recipe. Add it when you add the supplements and the enzymes, and scale down the helpings of homemade food in proportion to how much commercial food you are using.

A little bit (not more than  $\frac{1}{4}$  of the overall amount) of high-protein, low-carbohydrate, commercial kibble is perfectly fine. I recommend Blue Buffalo or Innova's Evo brand. These have fewer carbohydrates than typical commercial dog foods.

## Begin an Exercise Plan

The human body benefits tremendously from exercising. Exercising puts our bodies in better shape, which means we not only feel better, but we are also healthier and more ready to fight off illness. The same can be said of dogs with cancer.

One of the many physical problems in cancer is a loss of muscle. Another is a depressed immune system. Physical activity helps improve both of those issues.

But those are not the only benefits to exercise. Exercise also serves as an outlet for emotions, which is important because repressed emotions are detrimental to the body.

Exercise is generally a social activity, too, whether with humans or with other dogs. Being social helps dogs overcome loneliness, which in turn helps improve survival statistics.

Getting into the sun helps the body produce active vitamin D, which is a potent, naturally-occurring, cancer-fighting hormone.

Daily exercise also helps dogs sleep better, which in turn increases melatonin levels at night—an additional attack against cancer.

Not too bad!

So, get your dogs out if they can handle it. I understand that not every dog is in a situation where exercise is possible, but do what you can to get their blood pumping on a regular basis.

The secret to a successful exercise routine is in a gradient approach, where the routine is introduced gradually so our dogs don't get overwhelmed—and we won't feel overwhelmed, either! This is critical.

A couch potato pet will not do well going out for daily 5-mile runs, at least not right away. A lot of issues could result from too much exercise too soon, like ulcerated foot pads, torn ligaments in the knee, heat stroke, and other complications.

Every dog is different. Some are used to running behind bikes in the park, and some are happier lying in the grass and sleeping all day. Regardless of what kind of dog you have, I recommend you start very slowly. Twice a day

for shorter periods is better than once per day for longer periods. And even just five minutes is better than nothing, especially to start.

Go on walks, runs, or swims, even climb some stairs. Anything active is good. Try to remember to change it up, too. Doing the same thing every time bores the mind and the body. The body responds much better to changed exercise than to repeated routines.

Remember, dynamic stimulation is the name of the game. And as usual with all things cancer, consistency is key.

I'm going to cover many more ways to exercise with your dog in the next chapter, the final chapter in this section on Full Spectrum Cancer Care. Turn the page now to examine the many ways we can improve life quality for our dogs by making sure they really experience what I call the Joys of Life.

## Chapter Twenty-Four: Full Spectrum Cancer Care Step Six—Improve Life Quality and Happiness

We've already covered in detail the effect of stress on your dog's body, and the links between stress and the development of cancer. There is no doubt in my mind that dogs who are suffering from widespread cancer are under enormous stress—physical, mental, and emotional.

That's where Step Six comes in. Now that we have your dog's physical needs taken care of—she's on traditional treatments that deal with the cancer, she's taking the cancer-killing, cutting edge supplements, she's eating right and exercising, getting good sleep and resting up...

...let's make sure she's as happy as possible.

Happiness may be one of the most important “secret weapons” in your arsenal.

If you remember our discussion of the scientific field called psychoneuroimmunology—which explores the interaction between the emotions, the psychological system, the neurological system, and the immune system—you remember that there are intimate and direct connections between our emotions and our physical well-being.

Research coming out of this field demonstrates beyond a doubt that mind-body tools like meditation, visualization exercises, and touch therapies can dramatically impact our health, and by extension, the health of our dogs.

Incorporating some of the following tools into your Full Spectrum Attack Plan is very important, and I would not have included them if I didn't think

them essential. Some will make sense and be obvious to you, but others might sound a little strange or “out there.”

That’s OK.

I can promise you, just like I vetted all the drugs and treatments I mentioned in earlier chapters, I’ve vetted all of the following tools and techniques to make sure they *really work*. Let’s explore some now.

We’ll start with your dog’s personality.

## Stimulating the Joys of Life

What does your dog love to do?

Does your dog like to be active? Is she a couch potato? Does your dog like to be indoors or outdoors? Is he a walker, a runner, a wrestler, a fetcher, a sitter, a play dead-er, a passenger, a talker, a shaker, a stayer, a sunbather, a swimmer, a cuddler?

You probably already know what makes your dog happy. So while you treat the cancer with supplements and sleep, make sure you also bring more joy into your dog’s life.

One key component to bringing more joys into his life is frequent stimulation. Be dynamic and switch environments. Create excitement if you can, through your own voice and movements. You will know how much is too much if you pay close attention to your dog.

Another important component is to have your dog do things. It is in “doing” that joys in life can be experienced to their fullest extent.

For example, walking up a flight of stairs feels like an accomplishment for dogs. It gets their blood pumping and they feel good about reaching the top. Just like humans, dogs feel good when they’re engaged in an activity. They feel important and purposeful. This does wonders for their self-esteem.

Of course, you must be sensitive to your dog's limitations. Depending on age and personality, some dogs won’t thrive on activity the way other dogs will. For this reason it is important to always keep in mind what your dog is capable of and what your dog likes.

If your dog is a couch potato, don't take him on an hour walk, but ease him into activity with a 5 or 10 minute walk to start, building over time to longer walks.

If your dog is rarely around other dogs, don't take her off-leash in the middle of a pack in the dog park. Instead, arrange a play date with just one other dog, preferably an easygoing one, and then each time increase the number of dogs involved.

No matter which joy of life you are trying to expand for your dog, take it easy but keep the momentum going with steady increases in activity and stimulation.

You may be thinking, "But my dog cannot move much. What do I do?"

There is a lot you can do!

### **Stimulation for Dogs with Reduced Mobility:**

If your dog has limited movement, don't worry. You still have a lot of options.

- **Physical Therapy.** Repeatedly and slowly, flex and extend all the joints in your dogs' legs, for about 3-4 minutes for each joint. This will increase blood circulation and help with stiffness. Take care to be gentle, and don't force the joints.
- **Massage.** With flat fingers, apply gentle pressure in a circular motion where you feel large muscle groups. The lower back, thighs, shoulders, and back/sides of the neck are dogs' favorite spots. Again, be gentle. Make sure not to dig your fingertips or nails into the skin.
- **Grooming.** Gentle brushing with a soft-bristled brush stimulates the skin and feels relaxing for your dog.
- **Warmth.** This is especially useful if your dog is thin or old. Use warm (not hot) compresses on the body's joints to help with blood flow. You can soak a washcloth in a bucket of warm water and then apply the washcloth to a part of your dog's body. Focus on the lower back, hips, knees, shoulders and elbows. Warm hot water bottles work well, too, but make sure you use warm water, not hot. You can also buy pillows that are designed

for the microwave. They contain little beads that hold heat pretty well. Do not use electric heating pads or blankets, because the skin can get burned if they are not padded well. Also, always test the temperature on your own skin before you apply any heat to your dog's skin or fur. If it's too hot to comfortably keep on yourself, it's definitely too hot to keep pressed to your dog!

- Relocation. Move your dog outdoors. If you have to, carry him. One patient bought a baby's playpen and set it up on the back porch, so their dog could sniff the breezes. You can go for a drive somewhere nice so your dog can enjoy the sun and air. It will feel good and make a huge difference. I bring all my patients outside, regardless of age or mobility. If this is not possible, at least bring your dog next to an open window. She needs sunlight and fresh air.

## Psychoneuroimmunology: The Mind-Body Connection

As you know, psychoneuroimmunology is a fancy, scientific term for the mind-body connection. Earlier, we discussed the scientific proof behind the connection between health and mindset. Now we have to work to improve that mindset so we can improve health. There are a lot of ways you can practice psychoneuroimmunology.

### Meditate with Your Dog

Okay, it sounds a little wacky, I know, but go with me on this. When people meditate, it relaxes them and centers them, revitalizing body and mind. There is measurable, published, objective proof of these benefits.

The American Cancer Society found that those who meditate have better immune responses than those who do not. Furthermore, the University of Massachusetts Medical Center documented higher melatonin levels in meditators, and we know from our earlier discussions that melatonin has many different ways of fighting cancer cells. It is possible that meditation can have the same effect in dogs!

My friend James Jacobson wrote a whole book called *How to Meditate with Your Dog*. I recommend you locate this book and apply all the wisdom it has to offer. For now, though, here is a quick version:

Take five minutes to sit quietly with your dog, making sure you maintain physical contact, even if it is just your hand on your dog's head. The goal is to clear your mind. Focus on your own breath, and breathe deeply. If you want, try breathing in unison with your dog. It may help to think, "I am inhaling; I am exhaling."

Repeat these two sentences as you breathe in and out. Or you can choose some other word or phrase, if you prefer.

This word or phrase you repeat during meditation is called a mantra. Its purpose is to occupy your mind with a single, simple thought, so your brain can relax.

If other thoughts pop up, let them come and go, but don't allow yourself to focus on or become immersed in any single thought. Just be calm and allow whatever is going on to be, just as it is.

Allow your feelings for your dog to surface. Feel the compassion you have for him, and the gratitude and thanks for all that your dog has given you.

Your dog will be able to sense this calmness and this love, and it will help him more than you might believe.

Don't forget to touch him, as it will help convey your own state of mind.

As usual, consistency makes a difference. Try to meditate once a day, if you can, even just for five minutes. This will help you as much as it will help your dog!

## Visualization Exercises

In visualization exercises, you create for yourself a focused mental picture of what you want. The key with these exercises is to focus on what it would *feel like* if your desires occurred.

Perhaps your desire is for your dog to be completely healthy. Maybe you simply wish for your dog not to feel any more pain. Whatever your focus, do not let yourself feel bad about what you don't have right now.

Instead, imagine the feelings you would feel if your desired outcome was your present reality. Try to create those feelings for yourself, and immerse yourself in the experience of those feelings.

This is the way elite astronauts, athletes, and other top performers maintain their “mental muscles” in between performing their skills. If you do not have an opportunity to perform often, you can get rusty. But mentally rehearsing actions seems to be as powerful for the mind and the body as actually *doing* them. This is one of the reasons that visualizing positive outcomes can have a true impact on reality.

After a visualization exercise, you should end up with good feelings, happy feelings, and feelings of satisfaction. Allow those to resonate throughout your day, as if they were real—because to your brain, they were.

Although you and your dog may be going through something undesirable, it is okay to put yourself in the mindset of someone who is experiencing something better. At the very least, it will make you feel better. And if you get as good as someone like Tiger Woods...well, who knows what will happen.

Again, consistency is the key! Let yourself visualize your wishes often.

## Intercessory Prayer

Intercessory prayer is when someone prays for a desired outcome on behalf of someone else. Usually, this prayer is directed towards a deity. Whether you believe in the traditional Western religious concept of God, or in Buddha, or in Allah, or in some other higher power, intercessory prayer is a request for your God to intercede in your situation.

In other words, praying to improve your dog’s lifespan or quality of life could be an important thing to include in your cancer treatment.

This one may go over well with some readers and not so well with others. I recognize that not everybody believes in a higher power, so not everybody will believe in the force of prayer. I simply wish to present dog owners with a variety of means to improve outcomes.

If you want to pray, I encourage you to do so.

If you chose not to pray, it does not mean you are doing your dog a disservice.

But I do want to point out some pretty amazing proof about the power of intercessory prayer. There actually appears to be a measurable effect of prayer, even when those being prayed for don’t know it.

This effect was shown in a paper, published in the *British Medical Journal*. The study involved 2000 human patients who were hospitalized with sepsis—infections in the bloodstream.

Two groups were involved—a group of people who were prayed for (“the intervention group”) and a control group, who were not.

The length of time the intervention group spent in the hospital was much shorter than the control group’s length of stay. More than that, the intervention group members’ fevers went away much sooner than the patients in the control group. The paper concluded with the recommendation that intercessory prayer “should be considered for use in clinical practice.”

Once again, I am not ordering anyone to pray. But I also recommend you don’t knock it until you’ve tried it. It can’t hurt!

## Touch Therapies

There are many different types of therapies that focus on healing through touch. A good massage therapist in your area will likely know one or more of these techniques, plus others. They may even specialize in massage for pets, a practice in which one can get professional training.

Some of these practices include the following:

### Tellington Touch or TTouch:

Created by a horse trainer to calm down horses, TTouch elicits changes in brain wave patterns by lightly drawing circles all over the body. Sounds weird, but something about the repetitive motion and the attention to all body parts—even the gums—calms, relaxes, and creates a peaceful feeling in both the animal and you.

A study on Tellington Touch was published in the journal *Research in Nursing and Health*. This study intended to monitor the blood pressure, heart rate, anxiety, and pain of two groups of human patients—one receiving the Tellington Touch and one “no-touch control group.” While no measurable change occurred in anxiety and pain, the group who received the TTouch therapies showed “significant decreases” in blood pressure and heart rate.

At the very least, TTouch feels good to your dog, and it is an excellent way to be social and loving with each other. And that’s good for cancer.

### Acupressure:

Acupressure is a Chinese medical technique that manipulates the acupuncture meridians with finger pressure, rather than needles. Skilled acupressure therapists understand the Chinese medical model and are familiar with the points on the body that Chinese medicine uses to heal everything from asthma to cancer.

Because Traditional Chinese Medicine (TCM) predates the western scientific model by thousands of years, there is little “scientific” evidence that acupressure works. There is, however, vast historical evidence of its effect. While I do not advocate skipping any steps in the Full Spectrum approach, I consider acupressure a gentle, non-invasive adjunct therapy.

### Reiki:

Reiki is an energy therapy that involves the laying on of hands. It comes from Japan and involves the transmission of healing energy through the hands of the therapist into the recipient. It is sometimes described as a spiritual practice because both therapist and recipient can fall into a dreamlike state of contentment or bliss. Often sensations such as tingling or warmth seem to emanate from the therapist’s hands. Dogs often respond to Reiki with enthusiasm, as they deeply relax and let go of tension under gentle touch.

### Healing Touch:

Healing Touch, or Therapeutic Touch, is another energy therapy. This one was developed within the nursing field as a response to what some felt was the impersonal and clinical approach of modern medicine. According to these practitioners, many of whom are still nurses, there are energetic fields within and outside of the body, which carry the imprint of our illnesses. If we work exclusively with these “bio-fields,” we can actually shift the physical body. Those who receive this type of touch therapy find it deeply relaxing and very restorative.

## Whatever You Do, Just Do It

Whether they work with specific points in the body, like acupressure, or with the energy of the body, like Reiki and Healing Touch, touch therapies are useful at the very least for the elimination of stress.

And they may have other effects that have not yet made it into publication or systematic studies.

Eliminating stress is not a little deal. It's a very big deal, and that is why I recommend adding one of these touch therapies into your Full Spectrum Cancer Plan. As the *Journal of Clinical Oncology* confirmed in its study on stress and cancer, stress depresses natural killer cells (the cells involved in cancer immunity), causes signals in the body that increase angiogenesis (blood vessels growing to supply tumors), and makes tumors grow faster.

Since touch therapies reduce stress, it stands to reason that touch therapies help fight cancer. In fact, big human cancer hospitals offer touch therapy services as regular complements to traditional treatments.

If touch therapies help to lower anxiety and fight cancer in humans, they likely have the same effect in dogs.

If nothing else, spending more time petting your dog will reduce tension, relax the body, and calm the mind—for you and for her.

So while you're petting, why not try some circles and see what happens?

## You Choose!

All of these psychoneuroimmunology techniques are great ways to approach your dog's illness. They are designed to relax the body and mind and increase positive thoughts. The best part about these techniques is that your dog gets the benefit of your attention, which is guaranteed to help him or her feel better.

In the end, it is nobody's decision but yours which of these activities—if any—you will choose to use, but my strongest recommendation is to increase your dog's quality of life by using at least one on a regular basis.

## What Next?

We've come a long way, haven't we? If you are like most dog lovers (and certainly like I was when I started my research), when you first started reading this book, you had a fraction of the understanding of dog cancer that you do now.

By now you've probably determined at least some of the likely causes of your dog's cancer. And you now have a much better idea what you can do about it.

So it's time to make some decisions.

The next section of the book is called **Making Choices for You and Your Dog**. This is where we start to analyze all the information and organize it so you can figure out what to do next.

**Section V:  
Making Choices  
For You and Your Dog**

## Chapter Twenty-Five: Making High-Quality Decisions

Now that you've been through the wringer with me, I want to thank you and congratulate you. Doing your homework when it comes to dog cancer can be heart wrenching as you contemplate all that cancer does to the body. I hope it has also been empowering to learn about how possible it is to make things better for your dog.

As you look back over the Six Steps in the Full Spectrum Cancer Care Plan, I hope that you feel like you have enough information to make some good decisions about how to proceed with your dog's cancer treatment.

I also hope you will share this book and the information in it with your own vet, and include them in the process. Their insight into you and your dog is invaluable and can never be replaced by a book.

Take some time now to make some notes about your Full Spectrum Plan. You might want to start doing every step, immediately. Or you might choose to "file away for later" most of this information, and take action on only a few items. Any way you handle this information is OK with me, because you are in charge.

(That said, I believe—I know—that a full-on Full Spectrum Attack Plan will have the maximum impact on your dog's health.)

I want you to feel fully empowered in managing your dog's health. With my advice in this section, as with all advice you hear about your dog's cancer, I want you to feel totally empowered to tweak the program.

Keeping a journal during this time is essential to tracking your steps and the successes and missteps along the way. Use your journal to write down

supplements, medications, activities, vet follow-up appointments, reminders to yourself, grocery lists, and anything else. When you have a lot of different things going on, it is very hard to remember when to start and stop this or that, do this or do that.

As you implement your strategy in the coming weeks, if you notice any change for the worse, decrease the step you believe caused the problem, or stop altogether. If you are really unsure, stop everything immediately.

Once things are under control, begin introducing new additions every week and watch closely for recurrence of the problem. Once you have pinpointed the culprit, note in your journal and stop using it.

As you start making your notes in your journal, and start to formulate your plans, remember to relax. You deserve it, and so does your dog.

## What if I Still Don't Know What to Do?

Sometimes at this stage in the game—after learning everything there is to know about cancer and the full spectrum of treatments available, dog lovers look at me and say “But I still just don't know what to do.”

That's when my heart gives a little sinking feeling, because I know that if that level of confusion is being felt, there might be something bigger nagging at the dog owner's conscience.

Sometimes, if a dog lover is unsure about the course they want to take, it's because they are secretly asking themselves—whether they are aware of it or not—this kind of scary question:

**Is all this treatment really worth it?**

This is a very hard question to answer, and it deserves our undivided attention. The answer will be as individual as you and your dog are together as a pair, and we will start to answer it in the next chapter.

## Chapter Twenty-Six: Evaluating Life Expectancy and Life Quality

Many dog lovers faced with a cancer diagnosis in their dog ask themselves if the pain and trouble (and cost) of treatment is really worth it.

The truth is some cancers win in the end. Far too many, in fact, and while I firmly believe in and have personally experienced seemingly-permanent remission, I cannot predict that this is the case for your dog.

Answering the question, “Is treatment really worth it?” tears at your heart strings, no matter who you are. Contemplating the “worth” of your beloved dog can seem callous and cold.

But it’s actually an excellent question, and an important one to ask and answer. The only problem is, it’s not an easy question to answer, and no one else will be able to tell you what the “right” answer is, because the “right” answer is as individual as your fingerprint and as unique as your dog.

But the good news is that there are some ways to measure your dog’s potential for well being and stack them up against the available cancer treatments, in order to make choices that you can at least be confident in, even if you are not comfortable with them.

It’s really as simple (not easy, but simple) as measuring the general life expectancy of your dog (how long she likely has to live) against the kind of cancer she has, against the quality of life she is currently enjoying.

Looking at these measures objectively can put you well on the road to good decision-making.

So if you need to, take three deep breaths and feel your body calm down. This is a tough discussion ahead, and I need you to be fully present. Don't read on until you are really OK.

Ready? Good.

Let's start at the very beginning. Given what you know now, after reading this entire book, just how bad is your dog's cancer?

## Is This Cancer Hard to Cure?

Way back at the beginning of the book we talked about cancers that are Hard to Cure. These include cancers that have metastasized, are not eligible for surgery, and cancers that have a tendency to be quite aggressive.

You should discuss with your own vet whether the cancer is resectable (removable with surgery), aggressive (malignant), and whether or not there is already evidence of metastasis (spread).

Take the time to really get a good idea whether your dog's cancer is Hard to Cure. Your vet will be able to give you general information on the tumor type and cancer behavior based on the biopsy report. This will allow you to make the determination together.

If the cancer is not Hard to Cure, if it is not aggressive, if it has no evidence of metastasis, and if it can be removed without much chance of recurrence, I encourage treatment as suggested by your vet and as appropriate based on the Full Spectrum Cancer Care chapters. There is probably a pretty good likelihood of a positive outcome and a higher quality of life for your dog.

If your dog's cancer is Hard to Cure, you have a tougher decision ahead of you.

"Is treatment worth it?" is a hard question for me to answer without knowing more about you. You are your dog's owner and your dog's best friend, and so I cannot make this decision for you. Considering your own feelings and judgments is important because you and I and every other dog owner all have different ideas and expectations.

Some people want to do every possible thing, and will go to any length to stop their dog's cancer. Some owners want to keep their dog comfortable,

while letting nature take its course. Some owners want only certain types of treatments done, but not other types.

It is important to define your own viewpoint, especially your feelings in terms of life quality versus life expectancy. Life quality can be looked at as the balance between good things and bad things, from your dog's perspective. Life expectancy is how much more time your dog has.

But there's an even more basic question. So many people ask me this first when they hear the diagnosis of cancer: "Is he in great pain?"

That's an important question. Let's go there next.

## It's Not Just a Question of Pain

Without a doubt, pain makes for an unhealthy mental state. Pain is bad and blocks many joys in life. It is horrible having a pet in pain, and in a lot of ways it puts us dog owners in pain. Of course, we all want to avoid this as much as possible.

The first issue to consider is whether we are talking about permanent pain or temporary pain. There is an important difference between these two types of pain.

If a dog undergoes surgery, there will be temporary pain. Temporary pain can be lessened with pain control medication, and it will fade with time.

Chronic pain is never-ending, and presents a more difficult problem. While some medications can help ease chronic pain, too, they only provide short-term relief.

However, pain is not the only factor to consider. We sometimes put too much emphasis on pain and too little emphasis on other negative experiences. We need to adopt a broader viewpoint.

For example, depression, lack of appetite, lack of energy, and lack of desire to be social all reflect a loss of life joys for dogs.

So the question is not just, "Is my dog in pain," but also, "Does my dog have good life quality?"

## What Makes Life Good?

How can you tell when the life of your dog is no longer happy? This is an important question. We can ask it at the time of cancer diagnosis, during treatment, or during the end-of-life phase (whether or not cancer is a factor).

When answering this question, it is important to look at your dog's life from your dog's perspective. When you are trying to find out if life is good, you have to figure out what actually *makes* life good. What are the things that your dog really likes?

There are certain things that all dogs love about life. I list them below.

### Joys of Life For Dogs

1. The joy of eating and drinking. Most dogs like to eat when hungry and drink when thirsty, because food tastes good and cool water is refreshing. Hunger and dehydration are very unpleasant.
2. The joy of physical activities. Most dogs like to move around, play, frolic, frisk, or maybe even run and jump. All dogs like the freedom of movement!
3. The joy of normal social interactions. Dogs are social creatures. When something interferes with their ability to interact normally with you or with other dogs, the potential for this pleasure disappears.
4. The joy of having a body that does what it is supposed to do. Dogs feel better when their bodily functions are all operating normally. Going to the bathroom, breathing, and having the physical senses intact (smell, sight, etc.) all feel good for our dogs, just as they feel good for us. We know this because when we are deprived of things like air or the ability to see, it is very disorienting and unpleasant. Having normal bodily functions is something that dogs appreciate and enjoy.
5. The joy of having a healthy mental state. Depression, stress, senility, chronic pain, and other unpleasant altered states decrease life quality in dogs, just like it does for humans.

6. Anything and everything else. Because dogs are individuals with their own likes and dislikes, many other things could be included in this list. What are the big joys in your dog's life that are not on this list?

Whatever affects these things, whatever takes away what makes life enjoyable, is something that decreases life quality.

## Quality of Life Analysis

*“Life is a gift, and it offers us the privilege, opportunity, and responsibility to give something back by becoming more.”*

*--Anthony Robbins*

Assessing your dog's quality of life as objectively as possible is, in my opinion, one of the responsibilities of being a dog lover. We actually become more—we become better—in giving back to our dogs. By assuming responsibility, we are elevated to a higher state. The sacrifice of being responsible for your dog, even at your own expense, makes you more than you were before.

Take a moment to center yourself now, because we are going to start weighing the positives against the negatives.

If only one of your dog's joys is gone, I believe life quality, on average, can stay good, especially if the other joys are preserved.

For example, there are many blind people who have a good overall life quality. Yes, blindness is a major drawback, but blindness versus all other joys in life? The loss of vision does not make all the other good things in life go away. Those without sight can still enjoy everything else those of us with vision can enjoy: the pleasure of food, the enjoyment of physical activities, close relationships, and so on.

The same thoughts should be applied to our dogs when we are doing life quality analysis. One loss does not a bad life make.

Perhaps a dog loses its ability to walk around normally, for instance, because of the loss of a limb. Once, after I was forced to amputate a dog's front leg, I was overjoyed to see him hopping along in the water at the beach just a few weeks later. He was enjoying himself under the sun, wagging his tail and just delighted to be doing what he was doing.

All the other things in his life were still good. He was eating, drinking, enjoying his relationship with his owner, still using his body, and was happy. He was free of pain, depression and stress, and he was in a great place. Even on three legs, his life's joys were pretty much intact.

However, when two or more of life's joys are significantly affected, I believe we need to start questioning life quality. My opinion as a vet and as a dog lover is that when three of the joys are gone, the scale has tipped and life quality goes too.

What I just wrote may give you pause as you consider your own dog. It can be really hard to face the idea that your dog may have lost quality of life. Many of us have strong emotions come up when trying to analyze our dog's quality of life. There can also be a lot of input from those around us, and that input can make things harder just as much as it can make things easier.

This is a hard thing to think about.

To help you analyze your dog's life quality in the most objective and helpful way possible, I advise you to complete the following steps before starting your own analysis:

1. If you are feeling like the emotions are making it too difficult to think clearly, stop. Slow down. You do not need to come to a conclusion immediately. You are just looking at the facts. This does not mean you are automatically making a decision.
2. Recognize that you are in charge. Sometimes it helps to refocus on this fact. You are in the driver's seat. This is not always fun, but you owe it to your dog. Dogs give us so much that sometimes we take it for granted. Taking responsibility is your way of giving back to your dog, as a thank you for the gifts you have received from him.
3. Block off 10-60 minutes of your day where you will not be disturbed and do one of the exercises from earlier in this book.

You will need to use a lot of your focus here, because sometimes the feelings can be overwhelming. It can help to call a trusted friend or loved one for support during this time. Another option is to contact one of the support groups or help lines mentioned earlier.

4. When you feel clear, honestly ask yourself about your dog's life. Which are the joys that are still present? Which are the joys that are no longer there? Do the remaining joys still outweigh those lost? Try as much as be possible to be honest with yourself.

## Is It For My Dog or For Me?

This is another question that can come up. Some of us have a hard time differentiating between our needs and those of our pets. This can be very tough to untangle at times. The best advice I can give is to remember to look at the big picture from your dog's perspective.

It is extremely important to examine your responsibility to your dog. You have to really be ready to give back to your pet and accept responsibility for doing things on his behalf, not yours. Try to use that as your anchor: you want to be your dog's advocate. Refocus your attention on that whenever you start wondering if you are serving yourself instead of your dog.

Being your dog's Primary Health Advocate can actually make it easier to make decisions.

Look at treatment from your dog's perspective. You are probably ready to start looking at what kind of stance you take on life quality versus life expectancy issues in treating your dog's cancer.

### What Is Your Own Perspective On Life Quality vs. Life Expectancy?

To help you make choices about your dog's cancer treatments, I suggest putting yourself in one of these three main groups:

Group A: "I will do everything I can to stop the cancer. My main concern is keeping my dog alive as long as possible. I understand that side effects can happen and I am willing to deal with them if they arise, even though some may be serious."

Group B: “I want to keep my dog's life quality good and prolong his or her life, if possible. I will tolerate only some side effects in treatment, and would like to keep them minor. My main concerns are divided equally between life quality and life expectancy.”

Group C: “I want to keep my dog as comfortable as possible. I want to avoid any but the most minor side effects. My main concern is well being, and I will sacrifice life expectancy for life quality.”

Which group do you fit in?

Once you have clarified your personal direction, it will be easier to talk about decisions with your vet. It will be easier to get a real understanding of both the time gained by treatments and the side effects from treatments, and how you feel about them.

To tell if the time gained by certain cancer treatments is useful, we need to get an idea of average life expectancy. Just as one year to a human is not the same as one year to a dog, and a year to one breed is not the same as a year to another breed. This is a fact whether or not cancer is involved.

If your dog has reached the average lifespan of his or her breed, or is close to it, you might want to take that into consideration when looking at treatments. Perhaps you want to consider less invasive treatments, or treatments with minor potential side effects. You also might want to avoid treatments that are time-consuming.

Of course, every dog is different, just as every human is different. No one can truly predict how long any dog will live, just like you and I don't know when our day will come. But guidelines can be useful when trying to come up with an approach that makes sense to you.

## Life Expectancies

The following list contains the most common breeds and their average life expectancy. Every dog could be an exception to the rule, but this is a rough guideline for you to use when measuring your dog's life expectancy.

If your dog is a mixed breed, this list might not be as helpful. The average age for mixed breed dogs, though, is about 13 years old.

## Average Life Expectancy Based on Breed

Afghan Hound	12 years
Airedale Terrier	11 years
Basset Hound	13 years
Beagle	13 years
Bearded Collie	12 years
Bernese Mountain Dog	7 years
Border Collie	13 years
Border Terrier	14 years
Boston Terrier	12 years
Boxer	10 years, 4 months
Bull Terrier	13 years
Bulldog	9 years
Bullmastiff	8 years, 7 months
Cairn Terrier	13 years
Cavalier King Charles Spaniel	10 years, 7 months
Chihuahua	13 years
Chow Chow	13 years, 6 months
Cocker Spaniel	12 years, 6 months
Corgi	11 years, 4 months
Dachshund	12 years
Dalmatian	13 years
Doberman Pinscher	10 years

English Cocker Spaniel	12 years
English Setter	11 years
English Springer Spaniel	13 years
English Toy Spaniel	10 years
Flat-Coated Retriever	9 years, 6 months
German Shepherd	10 years, 4 months
German Shorthaired Pointer	12 years, 4 months
Golden Retriever	12 years
Gordon Setter	11 years, 4 months
Great Dane	8 years, 5 months
Greyhound	13 years
Irish Red and White Setter	13 years
Irish Setter	12 years
Irish Wolfhound	7 years
Jack Russell Terrier	13 years, 6 months
Labrador Retriever	12 years
Lurcher	12 years, 6 months
Maltese	13 years
Miniature Dachshund	14 years
Miniature Schnauzer	13 years
Miniature Pinscher	14 years
Miniature Poodle	14 years
Norfolk Terrier	10 years

Old English Sheepdog	12 years
Pekingese	13 years
Pomeranian	14 years
Pug	13 years
Rhodesian Ridgeback	9 years
Rottweiler	10 years
Rough Collie	12 years
Samoyed	11 years
Scottish Deerhound	9 years, 6 months
Scottish Terrier	12 years
Shetland Sheepdog	13 years
Shih Tzu	13 years, 4 months
Staffordshire Bull Terrier	10 years
Standard Poodle	12 years
Tibetan Terrier	14 years, 4 months
Toy Poodle	14 years, 4 months
Viszla	12 years, 6 months
Weimaraner	10 years
Welsh Springer Spaniel	11 years, 6 months
West Highland White Terrier	13 years
Whippet	14 years
Wire Fox Terrier	13 years
Yorkshire Terrier	13 years, 6 months

While this information can be useful, vets often use another, more general guideline in predicting life expectancy. We base life expectancy on body weight. I believe this to be more accurate for mixed breed dogs or for breeds where the average life expectancy is not actually known.

Dogs of about the same weight live about the same length of time. On the average, smaller dogs live longer, medium dogs next, and giant breeds have the shortest life expectancies.

### Average Life Expectancy Based on Size

Body Weight	Approximate Life Expectancy
Miniature (up to about 12 lbs)	14 years
Small (12-30 lbs)	13 years
Medium (31-50 lbs)	12 years
Large (51-80 lbs)	11 years
Giant (over 80 lbs)	9 years

Please note that all of the average life expectancies presented here are estimates only, based on published data and my own clinical experience.

After you have figured out the average life expectancy of your dog, it is a little easier to decide what to do next. Once you know realistically how much time you have left, you can decide which of the three paths to take.

## Hard to Cure: Choosing One of Three Paths

If you are dealing with a Hard to Cure cancer, you not only need to consider how much time is gained by different treatments, but also the negatives that are part of the treatments. Recall which group you decided you were a part of (A, B, or C), and review the following guidelines.

### If You Are Part of Group A...

...and your pet is at least six months younger than the average life expectancy for his or her breed or size, you might consider full treatment for most Hard to Cure cancers. This could include surgery, chemotherapy, radiation, and as many as possible of the Full Spectrum treatments included in this book.

...and your pet is within six months of, or over, his or her average life expectancy, you may want to check in with your conscience as to whether full treatment with possible serious side effects is what you want for your dog. You might want to consider a limited chemotherapy plan, palliative radiation, and surgery only if it will make your dog more comfortable. You will want to include the other treatment selections from the Full Spectrum Cancer Care Plan.

### If You Are Part of Group B...

...and your pet is at least six months younger than the average life expectancy for his or her breed or size, you should consider some conventional treatments. You might want to do a limited chemotherapy plan, consider palliative radiation and surgery, especially if it will make your pet more comfortable in the long run. You will want to take advantage of the additional Full Spectrum treatments in this book.

...and your pet is within six months of, or over, his or her average life expectancy, you will likely want to avoid surgery, avoid radiation, and maybe consider a very limited chemotherapy plan (pills taken by mouth only). You may also want to take advantage of the additional Full Spectrum treatments in this book.

### If You Are Part of Group C...

...and your pet is at least six months younger than the average life expectancy for his or her breed or size, you likely want to avoid surgery, avoid radiation, and maybe consider a limited chemotherapy plan (pills only). You will want to utilize the other Full Spectrum treatments in this book.

...and your pet is within six months of, or over, his or her average life expectancy, you will likely want to avoid surgery, avoid radiation, avoid chemotherapy, but will want to use the other Full Spectrum treatments.

## If You Have a Young Dog with a Hard to Cure Cancer

If your dog is younger than one-third of his average life expectancy, please remember that radiation and chemotherapy can have delayed side effects that are not seen until much later in life.

In an older dog, we never get the chance to see these effects because they don't take place within the lifetime of the dog. In young dogs, especially if we have success with treatments, there will be many years left in life. During this time, it is possible to see some delayed effects. These side effects are rare, but very serious when they do occur.

Radiation in particular has a serious collection of delayed side effects, which usually occur wherever the beam, or beam scatter, contacted the body. Sometimes the tissue that inadvertently received radiation during initial treatments develops cancer later in life.

As for chemotherapy, two commonly used drugs for treating cancers are the chemicals cyclophosphamide and cisplatin. Cyclophosphamide is a known carcinogen, and based on reliable studies, cisplatin is a probable carcinogen as well. As we know, carcinogens can contribute to cancer initiation. In other words, these cancer-curing drugs have the potential to eventually cause the very thing they are being used to treat, especially when used in younger dogs.

It is very important to consider this information before treating a young dog with radiation, cyclophosphamide, or cisplatin. I am not saying that you should definitely avoid these steps, but you certainly need to be advised of these facts, so you can make an informed decision.

## Putting It All Together

I hope that this section has helped you to think through the quality of life and life expectancy issues surrounding your dog's cancer treatment.

Making the decisions around cancer treatment is hard enough, even if you are hopeful of a positive outcome and have good right to feel that way.

But if you have seen that your time with your dog may be much more limited than you anticipated, or that your worst fears are probably coming to pass, you may want to read the next chapter, which deals with end of life issues and making your dog as comfortable as possible for her final days.

If you are not ready to read the next chapter, about what I call dog hospice, I then invite you to move on to the last chapter. I feel it is a very important one.

Turn the page now to read about how to care for your dog in his last days. While it is not easy to contemplate, it can be deeply comforting to know how beautiful—if painful—this time can be.

## Chapter Twenty-Seven: Making Your Dog Comfortable

The purpose of this book is to help you to create your own Full Spectrum Cancer Care Plan and deal effectively with your dog's cancer diagnosis.

However, as you already know, even the best plans don't guarantee that the prognosis will be good for your dog. Many dogs will succumb to the cancer, despite the very best care and support from you and your vet.

This sad fact is one of the hardest parts of being a dog lover and of being a veterinarian, but it is important that we address it.

I want to give you as much advice and support as I can. After years in the trenches of veterinary care, I have important information that I must pass on to you.

In my experience, dog owners always know when the end of a beloved dog's life is near. When that time comes, it's like something "clicks" inside the owner, and they "just know." If that is what you have found happening inside of yourself, this chapter is for you.

There are some tough decisions to make at this point, but there are also some practical steps to help you make those decisions. I will address those now.

### When You Realize the End Is Near: Dog Hospice

When you realize that the end of your dog's life is near, a great many painful emotions are likely to surface. It is tough to make decisions when you are grieving.

Later I will talk a little more about how to deal with the emotions that come up, but first I'd like to address the immediate issue you will encounter with your dog: deciding whether to continue cancer treatments, or whether to start the hospice process, otherwise known as comfort care.

The end of life can be a very confusing time for many of us dog owners. Sometimes we can feel torn, between continuing treatments which attempt to "fix the problem," and allowing nature to take its course. Often this terrible choice leads to confusion, frustration, and anxiety, on top of the sadness already present.

This is when it is really important to take a clear-eyed view of your dog's quality of life. The Life Quality Analysis we've already discussed can really help you in this examination.

If you take an honest look at your dog's Life Quality Analysis, and it shows more positives than negatives, you may in fact choose to continue cancer treatments despite the little "click" you feel inside of you. Perhaps the time is not yet right to enter into hospice care.

If the opposite is true, though, and your dog's life has more negatives than positives, knowing this fact can help you to accept that hospice is the best choice. Hospice treatments make your dog's comfort a top priority, so that the end of his life has as high a quality as possible.

If hospice is the right choice, it will be time to stop trying to "fix the problem," and start allowing what is already happening, to happen.

Hospice focuses on comfort and pain reduction. In order to accomplish this, I recommend you pay attention to the following things:

- **Bodily functions.** Keep your dog clean and dry. If your dog spends most of her time lying down, make sure she is on a padded surface. If your dog is typically staying on one side of his body, gently move him to the other side every 6 hours or so, to reduce body soreness and wounds induced by poor circulation.
- **Eating.** Dogs love to eat more than almost anything else, as you well know. At the end of their life, indulging whatever appetite they have left will increase their joy and probably increase yours, too. Feed your dog whatever he or she wants and is willing

to eat. Whether it is meat, angel food cake, Twinkies, or cat food, give it to them with pleasure. Some exceptions include chocolate, onions, grapes, and raisins, because these foods are poisonous for dogs.

- **Drinking.** Dehydration is both uncomfortable and dangerous, so prevent thirst and entice your dog to drink. Water, bullion broth, chicken stock, soups, or any other liquid is acceptable. You may have to coax your dog to drink, and in some cases even force the issue. A turkey baster is a decent tool to administer fluids (just squirt them in the back of the mouth). Another option is injecting fluids directly into the body, using a needle to dispense them under the skin but above the muscle. If you are interested in this, ask your veterinarian for a demonstration on how to give subcutaneous fluids.
- **Pain.** We want to prevent pain as much as possible. Load your dog up on the oral pain reliever Tramadol, or a similar pain medication like Metacam, Deramaxx, gabapentin, or Rimadyl as recommended by your veterinarian. Oral sustained-release morphine is not a bad route, but some dogs don't like the feel of it and may get whiney. Another option is the pain medication Fentanyl, administered through a patch that adheres to the skin. These patches last about 3 days, and you can get them from your vet.

In some states, you may have access to medical marijuana. The cannabinoids in marijuana are occasionally used in human cancer care to alleviate nausea and improve appetite. There is a prescription form called Marinol, which comes as a gel cap. You do need a doctor's prescription for this, so talk to your vet if you think your dog would benefit. Be aware, medical marijuana is also pretty expensive.

- **Sun exposure.** Make sure your dog gets sunlight and fresh air, and as much of them as possible. This will help him or her feel better.
- **Time.** Take as much time as you can to be with your dog, just sitting together or lying together. This will really help both of you, and is probably the most important thing you can do.

## How to Make a Final Decision

When the final moments of a dog's life have come, it is obvious to everyone involved. Often times the dog owner can "see" the request in their dog's eyes, which asks they be freed from their body. Some people refer to this as the "call to the Rainbow Bridge," after a famous poem about where dogs go when they pass from this life.

Though this is one of the saddest times in a human's life, it can also be one of the most profound. Navigating it can be tricky, and that is what I want to address.

One of the most important things I need to remind you is that no one can live forever. Not me, not you, and not our best canine friends. This is a hard fact to accept, but we've got to make peace with it. It is not an optional step in the process of life.

So if you find yourself resisting the very idea of your dog dying, you must deal with that, first. Breathe deeply, and remind yourself that death is a part of life. Many people often feel comforted by the thought that part of their dog will always remain with them, because the soul is eternal.

The next step is to think about how your dog's life should end. Should he be "allowed to pass" on his own, a process that can happen very slowly? Should you ask for an injection to put her to sleep, which will be over before she knows it?

I can't tell you this decision will be easy, because in reality it will probably be anything but. You will probably feel a lot of doubt, wondering what you should be doing, and perhaps hating every available option.

But there will always be a little voice in your head, a compass that directs you to choose what you honestly think is right for you, for your dog, and for your situation together. The trick is to be quiet enough to hear it.

The irony is that in order to become quiet enough to hear that little voice of wisdom, you may have to make a lot of noise first, as you express your emotions. If you do not experience them, they may rattle around inside of you and block your insight. So let them be, just as they are.

You may want to be by yourself for this, or you may want someone else with you, but in either case I suggest going to a place that you feel is safe and protective for you. Let yourself feel your emotions as honestly and as deeply

as you can. For some this will include crying, for some anger, for some just a deep, crazy-making pain. All of these are normal and fine. You can handle anything that comes up.

When you have experienced what is there for you, you will reach a point where whatever emotions are there simply burn out, like a candle that has run out of wick. Sometimes you can also make a choice to experience this “burnout.” After this happens, there will be a calm feeling, almost like a stillness and a fullness inside of you.

Then you will be able to look at your dog and honestly ask yourself if he or she wants to be here any longer.

Put your attention on your dog only, and gently place your own feelings aside. Consider the quality of your dog’s life. Feel into your dog’s experience as much as you can. From this calm, connected state, allow the answer to bubble up. It will come.

Of course, you can consult with your vet on this step. You can also talk it through with your friends and family. Sometimes talking helps.

In the end, though, the decision can’t be made by anyone but you. And the calmer you are when you make your choice, the more confidence you will have that despite how terrible it feels, it is the best choice for you and your dog.

## How to Say Goodbye

We all feel soul-deep attachments to our loved ones, friends, and family...and our dogs fall into all three of those categories. No wonder this is such a painful goodbye for dog lovers.

When it is time to say goodbye, it can feel as though someone is ripping your heart out. It can feel absolutely brutal.

However, some feel that in addition to the pain, the intense love they feel for their dog—and the dog’s love for them—opens their heart really wide.

Really being present with your dog at this important time will seal your bond, and it will help you to remember their love long after death.

## After You Say Goodbye

I am not a psychiatrist or a therapist, but as a veterinarian and a dog lover, I am very familiar with loss. I would like to offer a few words about the grieving process, which may help you if and when you face the death of your beloved dog.

Grieving will happen on some level, no matter who you are or where you are. This is further proof of how much you loved your dog, and what a great “parent” you were to him or her.

Give yourself permission to be sad. Sadness is a completely natural emotion, and you need to be okay with it. If you are like me and many other dog owners, a dog is like a family member, and you have experienced a real, genuine loss. Let yourself feel it.

For some, the grieving process tends to be very intense at first. Some people feel very emotional, very sad, very angry, etc. For others, the pain of loss may actually feel physical. Your head might ache, your stomach might hurt, and you might not be able to sleep. Or you might want to sleep all the time. All of these are normal reactions.

For some of us, it may feel like a deep sadness has taken hold and won't go away. The feeling sometimes sneaks up when we least expect it, cued by a scent or a visual reminder, maybe a movement or a noise. Sometimes these reminders occur during the day. Sometimes the sadness is worst at night, in the silence. No matter what you feel or when you feel it, know that you are not alone in your emotions and those emotions are completely normal. These are important steps in grief.

As time passes, those intense grieving sessions that some experience will be shorter, fewer and further between. Things will start to return to a relative state of “normal”. You may find that you are not thinking about your dog all the time. This is okay! It is not a betrayal of your dog, or a betrayal of your love for him.

If you are successful in grieving—despite how weird that sounds—your feelings of grief will gradually diminish over time. Most people never stop missing their dog, but you may find that if you really allow yourself to experience your feelings in the beginning, those feelings gradually give way to relieving, cooling, calm feelings. Things will start to feel OK again.

Finally, you will be able to joyfully remember your dog for the time you had together, rather than remembering the pain of her death.

This is all part of the grieving process, and of life itself. There seems to be some divine design to all of this, some arrangement of machinery where the earth spins and the heart beats.

In this grand design, there is a point for us each to enter this world, and a point at which we leave it. For dog lovers, the time in between is for connecting and loving.

If your dog could talk to you in English, right now, I imagine I know what he would say. Please turn the page to hear what I feel I have heard many times from dogs in my care.

## Chapter Twenty-Eight: If Your Dog Could Speak, This Is What She Would Say to You Now

“Thank you! Thank you! Thank you!”

I hear these words, or feel waves of gratitude, from every dog I meet all day long, and from every dog I have ever personally loved and cared for.

Dogs know what is important, and they make sure they remind us:

Cuddling. Sniffing. Eating. Sunshine. Running. Playing. Loving. Licking.

Dogs get it. They can be our greatest teachers.

And the most amazing thing about them is, they teach us from the moment we first meet them as tiny balls of fur, right up until their deaths just a decade or two (if we're lucky) later, and even beyond.

My memories of my childhood dog Bogart still come back to me when the wind blows a certain way on the fields near my house on the slope of a volcano on Maui. I can remember the same breeze like a shower of air, bathing his red hair, and his tail wagging as he picked up a delicious scent.

This memory reminds me to stop a moment and enjoy myself. I can hear him saying something like this to me at these times:

“It is good to be alive. It is good to be here. It is good to be with you.”

I don't think there is a dog on this planet who does not feel the exact same way.

And if their short lives are to be useful, it is to remind us of a few simple facts that we humans forget pretty easily.

“We are alive. We are breathing. We are here. We are smelling and tasting and the breeze feels good. We are holding each other and we like each other. We play and walk and run. This is good. You are good.”

Becoming your dog’s Primary Health Advocate is a great gift to your dog. His total trust in you is justified, because you are doing everything you can to love him as deeply as he loves you.

He thanks you for that.

She thanks you for that.

If your dog is with you right now, take a moment to look at him. Gaze at her with soft eyes and a melting heart.

This is why he was born, for this moment, right now.

If your dog could speak, she would tell you that her love for you is bigger than anything you can imagine.

Your dog would remind you to always remember: “You are loved. You are loved by me, your dog.”

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## Resources

This is a partial list of the research that went into writing this book. More information can be found on the website [www.DogCancerSurvival.com](http://www.DogCancerSurvival.com) in the Resources section.

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