

## **Ozone Therapy Used Instead of Antibiotics for Micro-Biome Restorative Therapy Yields Successful Outcomes for Dogs and Cats with Fecal Transplants**

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### Summary

Ozone therapy has been known to help gastrointestinal issues, but the addition of Micro-Biome Restorative Therapy (MBRT) offers another dimension in healing and balancing. Over 100 trillion microbes are known to reside in a normal human. We can assume that other mammals contain a proportionate number based on size. Over 500 species from the mouth to the anus and thousands of subspecies live in symbiosis. New microbiomes do not spontaneously regenerate after chemical and other assaults, and MBRT is a promising way to effect regeneration of the microbiome. Allowing a dysbiotic gut to be repaired and supported by ozone promotes health. We have administered Ozone Therapy to dogs and cats for many years as a subcutaneous fluid, gas insufflation as well as major autohemotherapy. We now find that Ozone Therapy is crucial when administering MBRT. The procedures for this double therapy, along with volume, form, and gamma concentrations are described. Micro-Biome Restorative Therapy is a cutting edge way to re-establish immune systems, as 85% of the immune system comes from the gut. Nutrition is also key in preparing and maintaining a healthy infusion of new microbes. Ozone can be used instead of conventional antibiotics to increase the success of these treatments. With

over 800 treatments in dogs and cats, we have seen a faster shift in health when we use Ozone together with Micro-Biome Restorative Therapy.

## **Abstract**

Micro-Biome Restorative Therapy (MBRT) can improve a range of gastrointestinal-related health issues such as Irritable Bowel Disease, diarrhea, GI infections like *Giardia* and *Clostridium perfenges*, skin disorders, and aggressive disposition in cats and dogs. MBRT can be administered by oral or enema fecal transplant from a healthy donor. Using Ozone Therapy as a rectal insufflation along with subcutaneous saline with O<sub>3</sub> is important in reducing the colon biofilm. Prebiotics, probiotics and gastrointestinal gut support have always been a part of MASH's care, but the addition of MBRT speeded the recovery remarkably and kept the balance by adding hundreds of species to the gut flora. Animals who had already tried probiotics and diet change for months without complete improvement reverted from positive *Giardia* and *Clostridium perfenges* to negative fecal tests within 5 days after the MBRT. Including Ozone is crucial for overall healing and success of MBRT treatments.

## **Introduction**

The importance of the microbiome endogenous to the gastrointestinal tracts of all mammals is becoming increasingly apparent. It is now known that the human body relies on over 100 trillion microbes of over 500 species of microorganisms (1,2). Based on this abundance and variety of microbial life, it has been estimated that 75-85% of the human immune system is dependent upon the gut microbiome, and imbalance in the normal symbioses of these species could lead to immune system failure resulting in disease, cancer, or mental health disruption (2). Currently, probiotics are used to support gut health, but these provide only between one and 20 species of microorganisms—a small subset of the actual microbial diversity.

Micro-Biome Restorative Therapy (MBRT) offers a natural and effective way to improve a variety of gastrointestinal-related health problems that are difficult or impossible to treat using standard methods. The author coined the term Micro-Biome Restorative Therapy in 2012 to highlight the need for restorative support for the microbiome. The previous term, “fecal microbiota transplant,” lacked a focus on the restorative nature of the treatment and focused on the word fecal, which is a distasteful term to use when talking to clients.

In recent years, MBRT has been increasingly used as a successful treatment option in human mainstream medicine, including at hospitals such as Massachusetts General in Boston, the Mayo Clinic, Cedar Sinai in LA., and Sinai Hospital at Johns Hopkins.\* Research on this promising therapy in humans is not yet abundant, but it is growing along with research initiated by the Human Microbiome Project (HMP), a NIH program, with millions of dollars being spent to identify the human microbiome.

In the natural world, many species of wild animals and even domesticated farm animals will eat the feces of other individuals. Among canines and some felines in the wild, this behavior, coprophagia, is normal. After a dog or cat kills its prey, it first eats the visceral organs of the abdomen, thus ingesting the prey’s microbial flora along with fibrous digested plant matter. Many pet dogs will eagerly eat the feces of other animals when the opportunity arises. However, coprophagia is generally frowned upon and disallowed by pet owners in developed areas of the world.

Ozone has been used as a rectal insufflation for years, and many feel that this procedure alone can correct irritable bowel and other GI issues. But how does one re-establish a microbiome that could have been destroyed by overuse of antibiotics, chemicals, toxins,

\*See [www.thefecaltransplantfoundation.org](http://www.thefecaltransplantfoundation.org) for a directory of practitioners and facilities that perform fecal transplants.

preservatives, chlorine, fluoride, GMOs/glyphosate, and other insults? Standard fecal transplants require several courses of antibiotics to reduce bacteria in the gut prior to transplant, but would Ozone treatments be a better way to prepare the gut than adding the effects of even more antibiotics? We have found this to be the case.

It is logical to assume that the most efficient way to restore the microbial load and therefore gastrointestinal function to a human or animal patient with deficient gastrointestinal flora would be transferring fresh feces from a human or animal donor with a healthy gut microbiome. In fact, veterinarians and veterinary students have been doing rumen transfers and pig feces transfers for at least 4 decades.\* The immune system uses the body's innate mechanisms to utilize newly introduced microbes to restore symbioses that enable systems and tissues to heal.

In humans, studies have shown that frequent use of antibiotics disrupts the natural gut flora (3). One study, for example, finds that the rate of Irritable Bowel Disease among children has doubled over the last decade as a result of frequent antibiotic usage (4). As cases of gastrointestinal problems, including Irritable Bowel Syndrome (IBS) and Inflammatory Bowel Disease (IBD), have skyrocketed at the same time that the quality of diets and environmental exposures have become more compromised, one can infer that individuals with healthy biomes would be relatively free from serious health issues, have had low exposure to chemicals (such as pesticides, pharmaceuticals, or water with added chlorine or fluoride), eat a raw diet, and spend ample time outdoors in a natural environment.

Studies have shown that both oral and rectal transfer of fecal material in humans has reintroduced a balanced gastrointestinal microbiome and decreased *Clostridium difficile*

\* In 1974 we were doing these in vet school at Tuskegee Institute.

overgrowth (5,6). Early evidence points to micro-biome restorative therapies as key to future treatments for gastrointestinal and immune system problems in mammals (6).

If the gut microbiome, which has hundreds of species of microbes in balance, creates 75-85% of the immune system, can nutritional approaches alone replenish and re-establish the balance of this biome in an animal? The microbiome can be supported by good nutrition, but without all the symbiotic species we may never be able to balance the health of an individual. No one has a definitive answer yet, but the knowledge of the numerous possibilities that exist to improve overall health that begin with a healthy gut should challenge all of us.

At my Massachusetts clinic, Main Street Animal Services of Hopkinton (MASH), we have been successfully using progressive nutritional approaches for 30 years. We had always told clients that it would probably take about six weeks for a significant turnaround in the health of their pets. Now, having performed more than 800 MBRTs on dogs and cats, we are consistently seeing significant reversals in health conditions in as few as two to three days. The results have been so positive that we want to share our methods and cases and encourage other veterinarians to consider MBRT in combination with Ozone Therapy.

## **Methodology**

Appropriate fecal donors have minimal exposure to chemicals, ranging from fluoride and chlorine in water supplies to chemical fertilizers or disinfectants used around the home. The suggestions that we have are ideal and we believe that any practitioner should strive to attain a naturally healthy donor that comes as close as possible to that ideal. We only use donors that are minimally vaccinated with vaccines that do not contain mercury preservations and aluminum hydroxide. We use titers for protection, as well as natural pesticides instead of chemical flea and tick spot-on or oral compounds. Before donating, we give donors fecal parasite exams and screen them with Plechner's Endocrine Immune Evaluation to check for normal immunoglobulin A, G, and M levels (7). Periodic PCR evaluations of the donors' feces also provide information

about the gut composition. We believe a raw meat diet free from antibiotics and also full of organic pureed vegetables and organic non-genetically modified grains and seeds like oats, millet, and quinoa is important. We feel it is essential that donors not have taken antibiotics, non-steroidal anti-inflammatory drugs, and other gastrointestinal suppressive medication, at least within the past several years, but most optimally to have never taken them during their lifetimes. There is a real concern that once the microbiome has been exposed to a course of antibiotics or strong chemicals, many species can be eliminated from the balance forever, since they don't spontaneously create themselves. Additionally, we look for donors that are physically active and raised with extensive time in outdoor natural environments. Optimal donors will be third generation animals raised naturally according to these criteria.

The fecal sample for donation is simply collected from the yard or litter box soon after defecation, making sure we are certain from which donor the sample is produced. It can also be manually extracted directly from the donor, but for humane reasons we prefer the first technique. We use a litter that does not have any odor-neutralizing antimicrobials which could affect the sample. Samples from multiple generations of dogs can be mixed to capture the experienced microbiome of an older dog and that of a young animal with all the natural growth hormones and youthful biome vigor.

We use four methods to administer MBRT: a) a piece of stool given directly, orally; b) stool mixed with saline and placed in capsules and given orally; c) stool mixed with saline in plastic cups, filtered via a sieve and given rectally; and d) stool mixed in saline in a small personal blender and given rectally. To thoroughly implant the biome throughout the entire gastrointestinal system, oral administration is the most effective, as it is more likely to repopulate the upper part of the GI system. However, going through gastric secretions may compromise some of the biome. Therefore, additionally doing a rectal infusion may ensure that more biome is transferred. Also, it is usually easier to administer the treatment rectally to animals that are

resistant to oral administration. The Ozone Therapy is done before the MBRT is started.

Subcutaneous ozonated saline is given first and then rectal insufflation with O<sub>3</sub> gas (see chart for amounts and gamma.) We retain the ozone within the colon for about 5 minutes by tucking the tail. We then allow the dog or cat to defecate. At that point we introduce the MBRT.

a) The first method of administering MBRT is to give it orally in the form of a small feces ball pushed to the back of the throat of the recipient animal. We give the patient a freezer dried raw treat before and after the feces. We sometimes conceal the fecal material in raw ground meat to encourage the patient to take the donor feces.

b) We sometimes mix the fecal material with a small amount of normal saline which we place into capsules to administer orally. We do not prefer this method, because the capsules dissolve very rapidly.

c) We also administer fecal material in an enema. A “three-cup method” can be used where no blender is available. When using the three-cup method, one cup is used to mix the saline and feces, one cup is pierced through the bottom in multiple places to make a sieve, and one is used to collect the mixture filtered through the sieve cup. The filtered slurry is administered through a syringe.

d) We liquefy the fecal material with saline in a small blender for maximizing utilization of the stool biome. To blend, 15+ grams or 1+ tablespoons of the fecal sample are combined with the saline enough to make a liquid slurry, and then strained. The mixture is blended as little as possible to avoid heating. Then we administer in an enema. Some of that liquid can also be given as an oral slurry with a syringe.

We coined the term “Micro-Biome Mixology” (MBM) as a way of combining feces from multiple dogs to enhance the possible responses. These combinations are done to give the natural hormones of an intact male to a male, and that of a female to a female. For dogs with cancer, we use the feces of Geneva, who has survived breast cancer for more than 5 years, and her grandson

or granddaughter who are puppies, and can offer youthful vigor. These puppies have been exposed to Geneva's biome, as well to their mother's, so they hopefully share a similar group of species.

Once the fecal mixture is created, it is loaded into a syringe. Before the fecal enema is given, a syringe of ozone/oxygen gas at 80 gamma was administered to the colon through a catheter. We use a natural lubricant with natural aloe and no antimicrobial properties in order to remove or impact the biofilm. Removing the colon biofilm with ozone gas and introducing more oxygen into the digestive tract increases the success of the fecal transfer. The catheter is removed and the patient's tail is tucked and held for 5 minutes to prevent leaking. The patient is taken outside to see if it is able to defecate to remove any of its own feces after the rectal ozone insufflations. To give the enema, a catheter lubricated with natural aloe is inserted into the colon. After administration, the tail of the patient is again tucked for 5 minutes and the abdomen of the pet is massaged to help the enema reach as much of the descending colon as possible. For at least four hours post-treatment—the longer the better—patients are prevented from defecating.

## **Discussion and Conclusion**

Our patients have been treated with MBRT for a variety of diseases and clinical symptoms. The overwhelming majority of our patients show improvement in a short amount of time.

To increase the success of the fecal transfer, the patients' gut flora is primed with digestive enzymes, probiotics, whole food glandulars, and raw meat diets. This helps establish a hospitable environment for the new biome. The example I give to my clients is: "If I asked you to move into a concrete apartment with a concrete bed and no carpets or amenities of life, would you want to live there and want to stay? Adding GI supportive nutrition gives the transplanted microbiome all the comforts home, which will create an environment in which the microbiome

would want to revivify and thrive.” Some patients are also supported with additional antioxidants, organic spirulina, ultra-fatty acids and glandulars. Additionally, patients receiving enemas have their colons primed with ozone to degrade the biofilm that could reduce the uptake of the transferred microorganisms. Transferring the donor microbiomes into primed patient digestive systems seems to better allow the new microbes to survive and promote normal symbioses in the patients’ systems.

Many patients are given MBRT in combination with other treatments, and the MBRT seems to accelerate positive outcomes. Some of these other treatments included acupuncture, homeopathy and chiropractic work. But Ozone has been a big part of the initial implantation. (However, when owners have come in for just an oral piece of feces to give at home, ozone is not usually taken home.)

Patients are given individualized courses of MBRT according to their clinical symptoms being treated and to their recovery progress. Some patients show complete and sustained recovery after just one MBRT fecal transfer. Others need the implant to be repeated regularly after one or two weeks for continued improvement. For these patients, we hope to fine-tune dosages and timing so that caretakers might be able to take home chilled MBRT material to administer to their pets multiple times per month to maintain the benefits of the treatment. More study is needed to determine how much fecal matter should be transferred and over what period of time to rebalance the gut microbiome optimally.

We believe that MBRT has been successful in replenishing the normal symbioses of endogenous gut microbiota in vast majority of the cases we have treated. Currently, separate glandulars, prebiotics, and probiotics are given to patients to support different organs or systems. Because the gut microbiome plays such an important role in many body systems, MBRT could be a more complete, effective, and inexpensive treatment option. Drugs and antibiotics currently used as standard treatment for many clinical signs, are less broadly effective, more costly, and

can also weaken the gut flora of patients. Ozone therapy has been a crucial component of MBRT. Conventionally in humans, the treatment protocol prior to administering MBRT includes a course of antibiotics to disinfect the gut. Vancomycin is the usual antibiotic used in humans (8). However, the overuse of antibiotics in humans often accounts for cases of Clostridium Difficile and other gut dysfunctions. Ozone Therapy reduces the biofilm and supports the gut mucosa, so it is the sensible application of Ozone that can foster success with MBRT.

With increased research in fecal bacteriotherapy, further knowledge about the hundreds of species endogenous to the digestive system and their relation to bodily health could be clarified. MBRT could then be optimized and used in place of other drug and antibiotic treatments.

I would like to describe several of our cases that highlight the considerable transformation that the introduction of MBRT effected, over using *only* nutritional supplements, Ozone Therapy, and other alternative therapies. The following seven cases show the efficacy of adding microbiome therapy to the treatment protocol. The remarkable changes seen in over 800 treatments have been nothing short of inspirational. (For the delivery system, amount, and concentration of Ozone, please refer to Table 1.)

Stovin, a white male three year old standard poodle, had been sick since he was nine weeks old with chronic diarrhea while on multiple antibiotics throughout his life. By the time he arrived at MASH as a patient, he had been diagnosed with Addison's disease, and was severely anemic even after a blood transfusion, was having seizures, and had chronic cystitis and bloody diarrhea. He received ozone therapy and nutritional support as well as acupuncture and homeopathics, after stopping all antibiotics and anti-inflammatories. After 5 days, he had the first normal bowel movement since he was 9 weeks of age. He was considerably recovered, but not completely. The fecal transplant given orally two weeks later gave him a total recovery and

stabilized his Addison's disease. Rebalancing the gut flora allowed for normal absorption of the food and nutrition and gave Stovin a normal life.

Archie, a seven-year-old neutered wire-haired fox terrier presented with aggressive behavior and digestive issues. Pharmaceutical medications for his behavior failed and he was kept on a very strict diet with lots of nutritional support for years along with many other integrative approaches, but still was very aggressive with his sister. Less than 24 hours after the MBRT, he was grooming and kissing his sister and could eat foods he could never eat without it causing him massive diarrhea. This agreeable behavior change stopped when he was given the heartworm medication Interceptor (Milbemycin Oxime). Less than 24 hours later his aggressive behavior returned when he attacked his sister. Monthly heartworm pills are antibiotics, and damaging the microbiome with an antibiotic can throw off the immune system and create behavior issues. Since subsequent MBRT treatments and being kept off the monthly heartworm preventative, Archie remains well-behaved and has minimal diarrhea.

Dudley is a 12-year-old male neutered poodle cross who was diagnosed with T-cell lymphoma. The owners decided to use an integrative approach to his cancer care. With his first round of chemo he received an MBRT and ozone therapy with ultraviolet blood therapy (UVBI) after each round of chemo. His blood work stayed completely normal throughout his chemo and he did not develop the interstitial cystitis that is common with this protocol. When he went out of remission, he was treated with an experimental lymphoma vaccine protocol, and received MBRT and ozone with UVBI after each vaccine in the series. When his Lymphoma returned for a third time, he was treated with rounds of chemo and again after each round, MBRT, ozone and UVBI. He has consistently had nutritional support with combinations of herbs and nutraceuticals. Now surviving 20 months, he bounces around like a puppy. He has received some of the useful biome from a young puppy in our donor group as well as MBRT from a cancer survivor. The youthful microbiome has given him the energy of a puppy. Throughout his conventional care, Dudley has

been allowed to receive all of this alternative treatment, and we believe that this has enabled him to have more successful remissions.

Sadie, a 10 month female spayed English Golden who had Giardia for six months, was treated and referred by Angell Memorial Hospital for a MBRT. After two days she had a normal bowel movement and at days 5, 14, and 30 had negative Giardia tests and continues to be negative 4 months later. By receiving a more balanced microbiome that had not been subjected to multiple antibiotics, the balancing of the biome has helped to stabilize Sadie's gut.

Bode, a four-year-old neutered male golden retriever, had chronic diarrhea for over two years and an unresolving *Clostridium perfringens* for the past two months. Had been on multiple antibiotics and nutritional supplements from four different veterinarians. With ozone therapy and after two days post- MBRT, the diarrhea stopped and one week later the *Clostridium perfringens* was negative. By re-populating the gut with a new balanced biome, the diarrhea was stopped and the balanced gut flora somehow pushed out the overgrowth of *Clostridium perfringens*.

Mojo, an 7-year-old neutered male domestic shorthaired cat, lived years with atopic dermatitis and had been treated with multiple courses of antibiotics, cyclosporin, antihistamines and steroids. He was put on nutritional support and ozone and given a rectal MBRT from a 1 year old siamese male kitten. Within a week he stopped scratching his face and was able to remove the Elizabethan collar. His attitude was much happier than it was prior. Six weeks later the owner requested a second MBRT. When he continued to improve, she requested a third one six weeks after the second. The owner called two days after the third fecal transplant and said there was a problem with his anal glands as he was acting odd. When she came in for me to see the anal glands, they were normal. After discussion of his behavior, we realized that he was sexually humping her arm. Had we given him the hormones and youthful vigor of the one-year-

old Siamese cat who was the new fecal donor? My comment to the owner was “Forget Viagra; we may have found the fountain of youth.” Mojo continues to get better and better.

Norman, an 8 1/2-year-old neutered male Ragdoll cat, had been vomiting for months and also exhibited inappropriate urination. He had lost over 3 pounds and seemed nauseous all the time. He had been on nutritional supplements and some were added, but two days after his ozone and MBRT he started eating as if he had not eaten for days and gained back 2 pounds. With another MBRT 10 days later he seemed really happy and has not vomited since that time. The Microbiome was rebalanced and allowed digestion to occur normally.

Norton , a 2 year old Labrador Retriever pup, had been trained by New England Dog Assistance as a therapy dog. He did not advance into the program for several reasons, but coprophagia was one of them. We started him on some nutritional support (he had already been on a limited raw diet), and gave him ozone rectally to address the biofilm. 2 days after the fecal transplant, his coprophagia behavior stopped. We can hypothesize that missing certain microbes in his gut made him seek out stool. Even though he was eating his own stool, it was from the same microbiome. Allowing a new more complete biome to set up a terrain in his gut enabled him to process his food more efficiently and most likely extract more nutrients to his body, thereby eliminating the urge to eat feces.

The range of clinical symptoms that benefitted from MBRT in the cases presented here, and the even wider range that we have treated in our practice, gives hope that MBRT along with Ozone Therapy could be beneficial in treating even more medical conditions.

In the near future, we hope to establish a fecal donor directory that could match healthy dogs and cats with animals in need of fecal transplant to re-establish their biomes. Veterinarians will then have a source of healthy animals to provide flourishing, active microbiome samples. More natural approaches to veterinary care including herbs, homeopathy, acupuncture, and chiropractic work reduces the need for drugs and antibiotics in patients. Raw meat diets,

including green tripe with lots of pureed raw vegetables, give canines and felines more of the evolutionary diet of their ancestry. We are also interested in the development of bowel nosodes of particular fecal groups as another method for administering fecal material. Bowel nosodes involve performing a series of dilutions on a fecal sample to increase the potency of the material to create a homeopathic remedy, which could make MBRT even easier to administer. The original bowel nosodes in humans were developed in the 1930's by Edward Bach MD, a bacteriologist, and John Patterson, a homeopath, at the London University College Hospital. Bowel nosodes are prepared from cultures of non-lactose fermenting flora of the intestinal tract. More studies are needed to determine the viability of microorganisms in homeopathic fecal capsules as compared to those in natural stool.

The possibility of premade fecal capsules could eliminate some of the “grossness factor” that unfortunately may have been inhibiting the development of MBRT to this point. Massachusetts General Hospital has done a study to show that frozen capsules of feces has cured *Clostridium difficile* in over 90 percent of cases (9). Clearly, MBRT is a promising therapy that should be developed for widespread use in veterinary, as well as human, medicine. The use of Ozone Therapy to reduce the biofilm and numbers of unhealthy bacteria in the gut, as well as to heal it, seems to be the best way to introduce a new microbiome.

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Table 1

Animal weight lb/kg	O3 - subcutaneous saline/cc or ml	O3 - rectal gas/cc	O3 combination saline cc/gas cc	Vitamin C + B complex cc + cc
10/4	40	40	25/25	0.5 + 0.2
20/9	75	60	50/40	1.0 + 0.5
30/13	100	75	80/45	1.5 + 0.5
15/22	130	100	100/50	2.0 + 0.75
75/34	145	120	125/70	2.2 + 0.75
100/45	190	140	170/100	2.5 + 1.0
125/56	210	150	180/120	3.0 + 1.0
150/68	250	150	200/150	4.0 + 1.3

NOTES:

- a) Gas administered rectally
- b) If animal has low body temperature, decrease saline by 30%
- c) If animal has cardiac issues, decrease saline by 40%
- d) If animal is older and/or weaker, keep warm at all times and add more gas rectally, up to 25% more
- e) If animal is younger and more vital, can give more saline subQ, up to 25% more
- f) Wait at least 10 minutes post O3 administration before giving vitamin injection subQ
- g) If animal has been on oral antioxidants, may not need vitamin injections

Ozone Dosages:

1 gamma = 1ug/ml = 1mg/L

1LPM = 1000cc/min = 1000ml/min

1/8 LPM = 125cc/min = 125ml/min

Saline is ozonated at 1/8 LPM and a setting at 8 = 88 gamma

Saline only saturates to 37 gamma

Unit is run for 30 minutes to saturate 1000cc of saline

Gas is given at 1/8 LPM and setting of 5 = 61 gamma

Cardiac issues and low body temperature will reduce the ozonated saline volume by 30%