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The Mysteries of Your Blood

Alexandra Mauer

Abstract: Did you know that your blood type can be useful for determining disease susceptibility and creating a diet that works best for your personal metabolism? *The Mysteries of Your Blood* is an article that delves into the science behind the ABO blood types and explains why your body handles certain foods, stress, and illness differently than someone with a different blood type. It proposes a unique way to avoid certain health problems by offering suggestions of what to eat and what to avoid eating.

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Did you know that your blood type can be useful for determining disease susceptibility or creating a diet that works best for your personal metabolism? Neither did I, that is, until March 6, 2015, at exactly 2:47 PM. That was the moment that my mother called and told me she had breast cancer. I panicked. Who wouldn't? And to make the situation worse, it was the day before I was leaving for my senior spring break trip to Fort Lauderdale—major buzz-kill. Then I refocused on what she was saying and heard,

> I've known for a few weeks but didn't want to tell you. I've been reading this book called *Eat Right 4 Your Type*™ and it talks about the ABO blood types and how they are associated with certain diseases.[1] They have a section on breast cancer, and it weirdly has made me feel a lot better! It even has suggestions for what foods you should and shouldn't eat.

So I decided to read it on the beach, surrounded by people enjoying their spring breaks. What I discovered was quite intriguing.

In *Eat Right 4 Your Type*™, Dr Peter D'Adamo shares the secret to eating for your blood type by delving into the science behind the ABO blood types and explaining why your body can handle certain food, stress, and illness differently than someone with a different blood type.[1] It proposes a new, perplexing way to determine how to avoid certain health problems while simultaneously offering suggestions of what to eat or, rather, what not to eat. So as I lay there enjoying the sun, I realized that no two people act, live, or eat identically. It would make sense that unique individuals with different blood types digest food, handle stress, and exercise differently, along with having different health problems. As intuitive as this sounds, we must ask if there is any additional evidence to prove that it all relates to ABO blood type. Believe it or not, there is.

Back up. What are ABO blood types? There are 4 different categories that we classify blood types under: A, B, AB, and O. In the United States, O is the most prevalent blood type followed by A, B, and lastly AB.[1(p16)] Type O is referred to as the "universal donor" while AB is referred to as "the universal recipient."[2] This means that type O patients can donate to all 4 blood types, while type AB patients can receive blood donations from all 4 types. Within each type, we also see a positive (+) or a negative (-) sign, which describes the presence or absence of the Rhesus factor (Rh).[3] Patients who are Rh-negative usually receive Rh-negative blood and patients who are Rh-positive usually receive Rh-positive blood.[3] This factor is particularly important in pregnant women,[3] but it also can play a role in a person's susceptibility to disease.

The ABO blood types are relevant in controlling, "the influence of viruses, bacteria, infections, chemicals, stress, and the entire assortment of invaders and conditions capable of causing disease and weakening immunity."[1(p35)] This occurs because each blood type has its own unique red blood cell (RBC) surface structures, also called antigens. For example, people with AB blood type have both A and B antigens on the surface of their RBCs, so they can receive blood from any type.[2] People with blood type O express H antigen on their RBCs, which is present but hidden in the other blood groups,[4] so they can donate blood to any type.[2] Antigens are crucial when it comes to immunity because if you receive a blood transfusion from an incompatible blood type, your body can develop antibodies against that foreign antigen and attack your blood cells.[2] This explains why O is the universal donor and AB is the universal recipient. Blood type antigens can act as receptors for a variety of pathogens and their toxins, including protozoa (eg, malaria parasites), bacteria (eg, *Helicobacter pylori*), and viruses (eg, HIV).[5]

Additionally, antigens may play a role in determining susceptibility to disease. By looking at the genetic expression of the ABO blood groups, we can further understand how each blood type is associated with various health problems. In *Eat Right 4 Your Type*™, Dr D'Adamo covers a variety of health problems and the higher risks for each based on blood type. I skipped right to breast cancer. According to a study published in 1984, scientists discovered that the ABO blood group exerts a significant influence on susceptibility and outcomes of breast cancer in women.[6] Substantial research showed that women who are type A are over-represented when it comes to breast cancer.[1(p179)] This means that having blood type A poses a significant risk for rapidly progressing breast cancer, and that these women have less desirable outcomes once they are diagnosed. On the other hand, women with type O are at a significantly lower risk of dying from breast cancer.[7] Women with

blood type B have a decreased risk of breast cancer; but if they have currently have or previously had breast cancer, there is no longer a reduction in the likelihood of reoccurrence.[1(p179)] My mom has blood type O, so I assumed she had also jumped to this section and this information made her feel better. That being said, we should also look into the credibility of these sources. Are there studies out there that prove this hypothesis? Are people with blood type O really less likely to die from breast cancer?

Researchers in China have conducted several meta-analyses of experiments that support the association of certain ABO blood types with various cancers. They looked at gastric cancer, pancreatic cancer, and breast cancer and discovered that the risk of cancer *is* associated with ABO blood groups.[7] People with type A have a higher risk of acquiring overall cancer, people with types B or AB are not significantly associated with overall cancer risk, and people with type O have a decreased risk of overall cancer.[7] In another study, it was found that the risk of breast carcinomas was 7.4 times higher in type A individuals than type AB.[8] An increased risk of pancreatic cancer has also been seen in individuals with type A blood.[7] In 2009, a study noted that blood types A, B, and AB were associated with higher rates of pancreatic cancer, while blood type O appeared to reduce the risk.[9] After discovering this, I became curious. What about other disease states?

Blood type is a major determinant of factors involved in blood clotting. Specifically, they are crucial for plasma levels of clotting factor VIII and von Willebrand factor.[4] While studying the relationship of these factors to different ABO blood types, an association with cardiovascular disease was discovered. Non-O blood type people have an increased risk of venous thromboembolism (VTE), and similar results occur for those with ischemic heart disease.[4] Furthermore, people with type O have approximately 25% lower plasma levels of von Willebrand factor than people with blood type A.[10] This can be detrimental for people with blood type O because lower plasma levels of these factors can cause excessive bleeding. However, higher levels of these factors are seen in people with blood type A, and these people have an increased the risk of ischemic heart disease and VTE.[10] A large-population study regarding the association of blood type with vascular disease discovered that non-O blood types have increased mortality, particularly due to cardiovascular diseases.[11]

Once more, we see that blood type A may be more prone to disease than blood type O. However, an additional study found a relationship between ABO blood types and the risk of acquiring peptic ulcers. Surprisingly, people with blood type O are associated with an increased risk of *Helicobacter pylori* bacterial infections, which can lead to peptic ulcers.[12] *Helicobacter pylori* is associated with several diseases such as gastritis, gastric ulcers, and adenocarcinomas.[13] Studies have suggested that there are less *Helicobacter pylori* receptors in individuals with blood types A and B than with blood type O.[13] With greater amounts of receptors, bacteria have a higher chance of binding and causing gastric ulcers in people with blood type O.

Are *Helicobacter pylori* infections the only disease state in which blood type O is a risk factor? No. Recall the earlier discussion of the Rhesus (Rh) factor. That seemingly insignificant plus or minus sign next to the ABO blood type can influence disease susceptibility. For example, a study conducted in Nigeria compared blood types between patients with diabetes. Interestingly, people with type O (-) were more likely to have diabetes than those with blood type O (+).[14] This further illustrates that people with type O are not always less susceptible to disease when compared to other blood types.

In addition to disease, blood type can factor into aspects of daily living. ABO blood types can play a role in how you eat, digest, and metabolize your snacks, drinks, and meals. In Dr Joseph Christiano's book entitled *Blood Types, Body Types, and You: Why Your Unique Genetic Code is the Key to Losing Weight for Life*™, he explains how blood types determine your body's ability to absorb nutrients, fight off disease, and lose weight.[15] In *Eat Right 4 Your Type*™, Dr D'Adamo created tables explaining why certain foods are either beneficial, neutral, or detrimental based on a person's blood type. One interesting example is the protein lectin. Lectins can be found in a variety of foods but are most commonly found in grains and legumes. When a food's lectin reacts with the blood type of the person eating, it can cause agglutination to occur.[16] Agglutination is a term used for when blood clumps and becomes sticky.[16] The sticky blood cells are believed to cause problems such as, "impaired digestion, kidney and liver problems, headache, diabetes, and obesity."[16] In order to avoid this "sticky disaster," certain blood types can abstain from or limit lectin intake.[16] Dr Michael Lam created a much simpler summary of D'Adamo's data that is included below in Table. Simpler List.[17] While the table is helpful, I realize that no two people are the same in how they eat, exercise, and live, so it would make sense that certain diets work for some people and not others. Even with the information Dr Christiano presents, he also urges readers to realize that some diets produce life-changing results for some people but not others.[15]

Although there are studies suggesting that the blood type diet does not work, Dr D'Adamo, Dr Lam, and Dr Christiano have made intriguing arguments regarding the subject and have influenced people to eat right for their blood type. Some people may have success with it, while others may not. Remember, everyone is different in how they live, exercise, and eat, so it makes sense that this type of diet works for some people but not for others. One person who has had success with this diet is Barbara Kempken Ertel, a Reiki Master, Kinesthetic Intuitive, Reflexologist, and Natural Health Educator.[18] Barbara became interested in natural health 25 years ago when she began to develop health issues and looked to improve her lifestyle. To avoid traditional western medicine, she looked at her diet, water consumption, exercise, sleep, supplementation, and attitude. [18] "Always being on the lookout for ways to improve my health, I came across the Eat 4 Your Blood Type diet over ten years ago and have followed the diet as an overall guide to food choices."[18] Barbara further explained that she is not a "strict diet follower" because she does not believe that one diet works as the perfect solution for everyone. [18] I asked her if she thought the diet was

Table. Simpler List[17]

	Diet profile	Allowed	Limited	Food to avoid for weight loss purpose	Food that helps with weight loss
Type O	High protein: Meat eaters	Meat Fish Vegetables Fruit	Grains Beans Legumes	Wheat Corn Kidney beans Navy beans Lentils Cabbage Brussels sprouts Cauliflower Mustard greens	Kelp Seafood Salt Liver Red meat Kale Spinach Broccoli
Type A	Vegetarian	Vegetables Tofu Seafood Grains Beans Legumes Fruit		Meat Dairy Kidney beans Lima beans Wheat	Vegetable oil Soy foods Vegetables Pineapple
Type B	Balanced omnivore	Meat (no chicken) Dairy Grains Beans Legumes Vegetables Fruit		Corn Lentil Peanuts Sesame Seeds Buckwheat Wheat	Greens Eggs Venison Liver Licorice Tea
Type AB	Mixed diet in moderation	Meat Seafood Dairy Tofu Beans Legumes Grains Vegetables Fruits		Red meat Kidney beans Lima beans Seeds Corn Buckwheat	Tofu Seafood Dairy Greens Kelp Pineapple

worth attempting, and she replied,

> I think it is worth a try. I found I felt better following it. It helped to level off my blood sugar and for me to stop feeling hungry all the time. And I just plain felt better.[18]

In *Eat Right 4 Your Type*™, Dr Peter D'Adamo explores the four ABO blood types, their association with disease, and their reaction with different foods and supplements. His reference guide proposes an individualized approach to symptoms, disease, conditions, vitamins, supplements, herbs, and foods that you may have or use. By explaining how blood types differ, D'Adamo demonstrates how different foods and pathogens react differently in your body based on your blood type. Ultimately, by following this "complete blood type encyclopedia," you can gain a broader understanding of your blood type and how it relates to what foods you eat, what health problems you are likely to encounter, and how to treat symptoms or illnesses. But is that enough? Although his book and several studies have been published regarding the relationship between ABO blood types and disease states, more studies need to be conducted. Further studies regarding the diet aspect of *Eat Right 4 Your Type*™ should also be conducted. The diet is intriguing and seems logical, but there are not many studies to back up D'Adamo's hypotheses on the subject. One study that is used to contradict Dr D'Adamo included 1,455 participants and concluded there is was no evidence supporting or disproving the diet.[19] However, the only evidence I need regarding the connection between ABO blood type and its association with disease is my healthy mom who now has control of her diet, her breast cancer, and her life.

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References

1. D'Adamo P, Whitney C. *Eat Right 4 Your Type™: Complete Blood Type Encyclopedia*. Riverhead, NY: Penguin Publishing Company; 2002.
2. Blood types. American Red Cross website. http://www.redcrossblood.org/learn-about-blood/blood-types. Accessed: December 30, 2015.
3. Mayo Clinic Staff. Rh factor blood test. Mayo Clinic website. http://www.mayoclinic.org/tests-procedures/rh-factor/basics/definition/prc-20013476. Accessed: December 30, 2015.
4. Zhou S, Welsby I. Is ABO blood group truly a risk factor for thrombosis and adverse outcomes? *World J Cardiol*. 2014;6(9):985-992. doi:10.4330/wjc.v6.i9.985.
5. Czerwinski M. Blood groups- minuses and pluses: do the blood group antigens protect us from infectious diseases? [abstract] *Postepy Hig Med Dosw* (Online). 2015;69:703-722. doi:10.5604/17322693.1158795.
6. Skolnick MH, Thompson EA, Bishop DT, Cannon LA. Possible linkage of a breast cancer-susceptibility locus to the ABO locus: sensitivity of LOD scores to a single new recombinant observation. *Genet Epidemiol*. 1984;1:363-373. doi:10.1002/gepi.1370010408. Cited by: D'Adamo P, Whitney C. *Eat Right 4 Your Type™: Complete Blood Type Encyclopedia*. Riverhead, NY: Penguin Publishing Company; 2002.
7. Zhang B, He N, Song F, *et al*. ABO blood groups and risk of cancer: a systematic review and meta-analysis. *Asian Pac J Cancer Prev*. 2014;15(11):4643-4650. doi:10.7314/APJCP.2014.15.11.4643.
8. Saxena S, Chawla VK, Gupta KK, Gaur KL. Association of ABO blood group and breast cancer in Jodhpur. *Indian J Physiol Pharmacol*. 2015;59(1):63-68. http://ijpp.com/IJPP%20archives/2015_59_1/63-68.pdf. Accessed March 20, 2016.
9. Wolpin BM, Chan AT, Hartge P, et al. ABO blood group and the risk of pancreatic cancer. *J Natl Cancer Inst*. 2009;101(6):424-431. doi: 10.1093/jnci/djp020. Cited by: Greer JB, Brand RE. New developments in pancreatic cancer. *Curr Gastroenterol Rep*. 2011;13(2):131-139. doi:10.1007/s11894-011-0175-y.
10. Jenkins PV, O'Donnell JS. ABO blood group determines plasma von Willebrand factor levels: a biologic function after all? *Transfusion*. 2006;46(10):1836-44. doi:10.1111/j.1537-2995.2006.00975.x.
11. Yamamoto F, Cid E, Yamamoto M, Blancher A. ABO research in the modern era of genomics. *Transfus Med Rev*. 2012;26(2):103-118. doi:10.1016/j.tmrv.2011.08.002.
12. Etemadi A, Kamangar F, Islami F, et al. Mortality and cancer in relation to ABO blood group phenotypes in the Golestan Cohort Study. *BMC Medicine*. 2015;13:8. doi:10.1186/s12916-014-0237-8.
13. Boren T, Falk P, Roth KA, Larson G, Normark S. Attachment of *Helicobacter pylori* to human gastric epithelium mediated by blood group antigens. *Science*. 1993;262(5141):1892-1895. doi:10.1126/science.8018146.
14. Okon UA, Antai AB, Osim EE, Ita SO. The relative incidence of diabetes mellitus in ABO/Rhesus blood groups in South-Eastern Nigeria. *Niger J Physiol Sci*. 2008;23(1-2):1-3. doi:10.4314/njps.v23i1-2.54897.
15. Christiano J. *Blood Types, Body Types, and You: Why Your Unique Genetic Code is the Key to Losing Weight for Life*™. Lake Mary, FL: Siloam; 2004.
16. Nurmi D. Blood Type Diet. Diet.com website. http://www.diet.com/g/blood-type-diet. Accessed: November 9, 2015.
17. Lam M. Blood Type Diet. Dr Lam website. https://www.drlam.com/blood_type_diet/. Accessed: November 9, 2015.
18. Ertel BK. Email Communication. January 3, 2016.
19. Innes E. The Blood Type Diet debunked: Study confirms that fad regime has no scientific evidence behind it. DailyMail.com. http://www.dailymail.co.uk/health/article-2540757/The-Blood-Type-Diet-debunked-Study-confirms-fad-regime-no-scientific-evidence-it.html. Published: January 16, 2014. Updated: January 16, 2014. Accessed: November 28, 2015.