

Chapter 7

Glyconutrients for Babies and Children

Dr. Vicky Arcadi

Everyone needs glyconutrients, but our children are in the greatest need. Do you wonder why?

The world today is not what it used to be. Toxins are everywhere - in the water we drink, the air we breathe and the food we eat. For example, the notorious pesticide DDT has been outlawed in the United States, but it can still be detected in our rainwater. Earlier tests have detected it even in human breast milk. Like the saying goes, "We are one world, one planet." These toxins are poisonous to all of us, but the most vulnerable are our children, born or unborn.

It is no wonder that children are born today with cancers. Some are born with congenital disorders never seen before. New syndromes and conditions are being described by clinicians every year. Genetic diseases are on the rise, both from inherited genes and mutated genes.

Our children are the most sensitive of any group in our society, which is why they need protection. They also need to be supplied with the necessary tools to allow their little bodies to grow and heal by themselves. This topic is what will be discussed in the following pages: how we can help our children by feeding them, among other things, some essentials that have been on our planet from the beginning of time - glyconutrients.

In the last chapter about pregnancy, we discussed some potential benefits of glyconutrients. We discussed why it is important to have the nutrients added to a pregnant woman's diet to enhance her own health and the health of her unborn fetus. Now it is important to discuss the benefits that these nutrients have on the generation of tomorrow - our children.

One of the most popular concerns regarding glyconutrients is their safety for babies and children. If you did a thorough study of what these nutrients really are, you will find that they come from foods. Glyconutrients are mostly from the plant kingdom and are non-toxic at any level. The recent problem has been that we don't seem to get enough of these foods in our diets. They are just not available as such in the

industrialized world. We cannot go to the market and buy them.

Why are these nutrients so important? They provide the necessary elements, or tools, for our cells to communicate. They provide the *glyco* - in glycoproteins which are indispensable to the structure and function of all cells. Without these nutrients, we most likely will function at less than optimal levels. We might not be able to fight off intruder microorganisms, such as bacteria and viruses, because the cell-communication lines that govern our immune response are not there. It is like trying to communicate without some vowels in our English language. We have **eight** glyconutrients that are necessary to communicate and, in most cases, we only get adequate amounts of **two** of these nutrients. As far as medicine is concerned, Glycobiology (the study of vital sugars in living systems) has been one of the most exciting new research fields in the past couple decades. More and more exciting and valuable studies on these nutrients are being reported each year.

So how can we and our children get all eight of these nutrients? *We must supplement* our basic diet, or perhaps move to the Fiji Islands and live off the land. Obviously, and happily, it is more practical to supplement, even though a trip to the South Pacific is always an attractive option.

Breastfeeding Is Best

You will be happy to learn that there is one safe food which contains most, if not all these nutrients. It is specially designed by nature for babies. This food is of course, human breast milk. It is no accident that a new lactating mother will actually make the food for her baby to contain these rich nutrients. A healthy newborn will search to find the mother's breast within thirty to ninety minutes after birth. This is an innate or instinctive action and clearly, the newborn's first priority. Not only does the breast milk contain most of the eight necessary glyconutrients (in the form of glycoconjugates, glycoconjugate sugars, simple sugars, glycoproteins, oligosaccharides, etc.), but it also contains various antibodies and the perfect balance of fats, amino acids, carbohydrates and water.^{1,2,3} It never gets any better than this for babies. The Intelligent Design we find in nature is wiser than all human innovation.

The US Food and Drug Administration (FDA) recommends breast milk over cow's milk. In the October 1995 issue of *FDA Consumer*, Rebecca D. Williams wrote, "Cow's milk contains a different type of protein than breast milk. This is good for calves, but human infants can have difficulty digesting it. Bottle-fed infants tend to be fatter than breast-fed infants, but not necessarily healthier." She also

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added, "New parents want to give their babies the very best. When it comes to nutrition, the best first food for babies is mothers' breast milk." She goes on to say, "More than two decades of research has established that breast milk is perfectly suited to nourish infants and protect them from illness. Breast-fed infants have lower rates of hospital admissions, ear infections, diarrhea, rashes, allergies and other medical problems than bottle-fed babies." *Breast is best* is no longer a controversial issue, if indeed it ever was. All the experts today agree.

But the recent statistical history of breastfeeding in the United States is quite interesting. In 1958, just 20% of babies were breast-fed. In 1980, that number increased to 60%. Then, in 1990, an amazing 90% of babies were breast-fed! However, in 1993, that number dropped to only about 56%. That drop is of concern to some. And well it should be. The trend is now moving in the wrong direction.

The FDA, along with the American Academy of Pediatrics, is also tracking the length of time babies are breast-fed to determine immune function benefits. Ruth Lawrence, MD, Professor of Pediatrics and Obstetrics at the University of Rochester School of Medicine in Rochester, NY, and a spokeswoman for the American Academy of Pediatrics, states that the Academy recommends babies be breast-fed for six to twelve months. But it would seem to make sense that the longer the child breast-feeds, the healthier that child will be. It also stands to reason that the child will grow into a healthier adult.

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Breast milk is well-suited for human growth and development because it is uniquely designed by nature for this purpose. Humans also have more highly developed frontal lobes. Breast milk contains all the nutrition and glyconutrients necessary to encourage and support the rapid brain development and growth of newborns and infants. There has never been an exact, synthetic duplication of breast milk and one will probably never exist.

Lars Hanson showed in his longitudinal study on breast milk, how breast-fed babies benefit later in life with "the transfer of immunity between mother and baby. Thus, it seems that breast-feeding might limit the appearance of certain diseases, such as allergies, autoimmune diabetes and celiac disease."⁴ The point is simply that breast milk is the best food for babies. In fact, hypothetically, to consume breast milk as part of our diet each day of our lives would certainly benefit anyone,

young or old.

Here's an interesting practical application. In clinical practice over the last 21 years, we have seen many babies that, soon after birth, have contracted all kinds of eye irritations and infections. This is not uncommon as the baby's immune system is very premature. After birth, the baby is exposed to our environment which is filled with numerous infectious elements. Rather than recommend an antibiotic drop or ointment for the eye, we have often recommended breast milk. Yes, breast milk can find natural application for topical use. After all, breast milk contains all the nutrients needed to help the baby's new body fight infection. So, we have often had the mother squirt breast milk into her baby's eye and it is not unusual to find that, sometimes within a day, the baby's body is able to take care of that infection. That's just one example of the healing power of breast milk.

As mentioned earlier, breast milk is known to contain most of the eight critical glyconutrients that all of us need in our diets for cellular communication and cellular function. Again, they provide the *glyco* - in glycoproteins. Is it not a wise strategy for disease-prevention to then continue supplementing these vital elements found in breast milk, so that we can continue to get all the nutrients needed to sustain optimal health? It makes sense, especially since we know that they have no toxicity and the body recognizes them only as food. What could be better than breast milk? The answer? Nothing. However, a complex rich in the essential glyconutrients would be a close second.

As a side note, one question that often arises with mothers is how to give these nutrients to their infants.

We discovered one way that worked very well with an eight-month-old baby who had severe cancer of both retinas of her eyes (called **retinoblastoma**). The baby had undergone the maximum of eight rounds of chemotherapy. Every month she had to be put under anesthesia so that the doctors could laser off the tumor in both retinas to hold off and reduce the tumor growth. The baby could not eat food. She could only breast-feed. The mother wanted to know how to give more of these nutrients to her baby. The best delivery system we thought, was to have the mother add large quantities of the glyconutrient complex to her diet every day to enrich and increase the concentration of the glyconutrients already in the breast milk. Interestingly, the

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baby soon started to get an appetite and she started to grow three teeth. Her tumors started to die and she began to eat more and more food. As she started eating more food, we were able to add the nutrients directly into her own food. Her body was beginning to heal itself with cellular communication and her enhanced immune system continued to fight the cancer. It is remarkable that in almost every single case with this type of cancer, the eyes would have had to be removed. However, fortunately for this child, six years later and still taking these nutrients, she only lost one of her eyes. She never gets sick and she is doing very well in school. She is having a normal, healthy life.

If a mother would like to add these nutrients to an infant's formula or breast milk, that is something that is safe to do. Remember that the breast milk contains these nutrients already. But for children of all ages, they are safe and non-toxic. You would be simply adding nutrients that aren't available in the diet, to promote optimal health. If a child has a serious illness, these nutrients are still safe. However, it is advisable to consult with the pediatrician or specialist to at least monitor their medications, if any, and to follow the progress of the child. Remember: a sick child is always vulnerable, (the younger the child, the more true that is) and one should never presume in the face of any acute childhood illness.

Some Common Diseases in Children

Numerous children today are afflicted with serious chronic illnesses, some of which were never previously common in children. One such disease is **Diabetes** Type 2 which is also ironically known as "adult onset" diabetes or even more precisely, non-insulin-dependent diabetes mellitus. As of 2004, 1 in 500 children in the US have a diagnosis of diabetes, including both Types I and 2. We can compare this to 1945-1969, when a mere 1 in 7100 children had diabetes. Since 1958, diabetes in the United States has tripled to 16 million cases and is now the fourth leading cause of death overall.

Studies have shown some impressive improvements in patients with diabetes and its associated complications, after supplementing with glyconutritionals, with and without other nutraceuticals. The result was a 97% overall health improvement.^{5,6} Up until the discovery and testing of these nutrients, there were never results such as these in diabetes studies, for any other form of dietary supplementation. More studies, especially with Type I (juvenile diabetes), are necessary. But there are indeed, some anecdotal cases of Type I diabetics reducing their insulin need through the use of glyconutritionals. However, please note, espe-

cially with diabetics, blood sugar levels must be monitored very closely.

But are these nutrients safe for children even if they are taking other medication? The answer is yes! These nutrients are foods - foods that we don't get in our diets anymore - and they are as safe as breast milk. However, it must be reiterated that **any child on medication must be closely monitored by their physician.** Medicines taken with glyconutritionals have had the reputation of working better in the body, even sometimes reducing the required medicinal dose for the same intended effect. These nutrients are believed to help cellular communication, affecting all levels.

Another disease on the rise with children is **asthma**. In 2004, nine million children in the United States were diagnosed with asthma. This is a dramatic increase compared to 1979 when only two million children suffered from asthma. In fact, asthma is now the leading cause of chronic illness of children in the United States. Asthma causes 500,000 hospitalizations and about 5,000 deaths annually. It is the sixth leading cause of death in children ages five to fourteen. The associated health care costs are in the billions each year, mainly due to the hospital visits and the numerous medications and inhalers asthmatics must use each day in order to breathe properly.

Difficulty breathing, with wheezing and sometimes more serious complications, represents a common presentation in most pediatric emergency wards. Of course, such attacks can indeed be life threatening. The classic *status asthmaticus* is a dire emergency. But that is serious stuff. It is late-stage intervention and management, when the young asthmatic can hardly get adequate air into their lungs. Long before that, children with reactive airway disease and hypersensitivity to environmental triggers need to be managed more proactively.

A study was done with fourteen asthmatics following a program of glyconutritionals, and glyconutritionals containing phytonutrients and phytochemicals, for a period of three to thirteen months. The results showed an 86% reduction in the number of symptoms associated with asthma, with a 72% reduction in the number of other medications they had been taking.^{7,8}

There has also been great success with chiropractic spinal adjustments in the management of asthma in children. Chiropractic care is highly recommended in the integrated approach with any child suffering from this disease. An article appearing in *The Journal of Vertebral Subluxation Research*, Vol.1, No.4, demonstrated the positive effects of chiropractic care on 81 children with asthma. Part of the approach, as

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with any disease, includes nutrition. It is well-known that better nutrition leads to better health. The nutrition of choice, from the research and results seen in clinical practice, overwhelmingly points to glyconutrients.⁹ These children are deficient and the glyconutrients are known to be safe.

In the past, for conditions such as diabetes and asthma, our only treatment choices at best, were medications, vitamins, minerals and herbal remedies. There had never been anything available that worked at the cellular level. The monosaccharides, or glyconutrients, go inside the cell. The glyconutrients originate from foods and are classified in a new category termed "nutraceuticals." Nutraceuticals are food products, with no toxicity, that have pharmaceutical effects on the body, and are supported by science. Medications, vitamins, minerals and herbs have toxicities at certain levels. In both diabetes and asthma, the basic complication is that we are dealing with immune function issues. With the use of glyconutritionals, we are seeing immune function improvement as the body begins to heal itself, and with no known toxicity.

Some Rare Disease in Children

In 1997, we published the first Case Report utilizing glyconutrients with children who have a rare genetic condition called **Tay-Sachs disease**.¹⁰ Children with this disease do not usually survive past the age of two to four years. It is a disease found in the Ashkenazi Jewish culture of Eastern European ancestry. Pregnant women of this heritage are screened in order to detect the gene in the fetus. If detected in the fetus, most often, a therapeutic abortion is recommended. There is no hope of survival for these children as they are missing an important enzyme.



This study was based on a child we saw who was Japanese and who had to be fed through a nasogastric tube through the nose and into the stomach. The child was three years and nine months old and he weighed 16 pounds. All he could do was lie down. He wasn't able to move, he could no longer speak, he could no longer see, and he had limbs that were stiffened from the neurological damage associated with the progression of the disease. He had seizures and was deaf. He couldn't swallow and his head was oversized in proportion to his body.

The worst part of this disease clinically, can be the struggle of the caretakers with the constant respiratory infections and the extremely weakened function of the immune system. The child is compromised and sick all the time. The parents are burdened with weekly doctor's vis-

its and numerous hospital stays. It is a very sad situation to experience. These children most often succumb to pneumonia.

The results of this study were phenomenal. The glyconutrients were recommended as a supplement to the nasogastric diet. The complex of glyconutrients did not require digestion and therefore were quickly utilized without any extra energy expended. This was very important because the child was literally starving to death. The results surprised all of us and demonstrated the safety of the glyconutrients, and also the power of the human body to heal itself. The child immediately started to gain weight and absorb his foods. From this study, we determined that better absorption was the first thing that happened. The second was that his immune system quickly became stronger. He stopped getting sick. The third thing that happened was that he began to feel better. As these positive effects began to take hold, his body, on its own priority system, began to heal itself. Remarkably his sight and hearing returned, his stiffness and spasms decreased and he had better digestive function. Within six months he gained fourteen pounds. He also received chiropractic adjustments two-three times a week. This was a case report, but no one in the attending medical community had ever seen improvement such as this in a case of Tay-Sachs disease.

This study launched more research and interest in adding these nutrients to the diets of other sick and dying children. There have now been significant numbers of children with genetic conditions responding well to glyconutrient treatment.

Another genetic Case report we published dealt with children who had Prader-Willi Syndrome. This is also a genetic condition where the children, with mental retardation and low muscle tone, eat themselves to death.¹¹ Then there was the case of cystic fibrosis, an inherited and fatal degenerative disease of the exocrine glands affecting the gastrointestinal tract and respiratory tract.¹² These Case Reports involved introducing glyco nutrients for the first time by simply adding them to the childrens' normal diets. In addition, other researchers looked at children with muscular dystrophy, specifically the FSH (or fascioscapulohumoral) type, which is also genetic. They also showed improvement when glyconutrients were added to their diets along with the use of a calcium channel blocker medication.¹³

What we are seeing in these children, after the addition of the nutrients to their diets, has been astounding and very rewarding. These children have benefited simply by improving the quality of their nutrition. The obvious way to benefit from improved nutrition is to add to any diet what is deficient in that diet. The glyconutrients were obvious-

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ly deficient in such cases if they could not breast feed and/or once they stopped breast-feeding. **What we did with these children was to give them back what was missing.** The concept is so simple and so basic.

Another affliction that must be addressed with babies and children is the overwhelming number of cases arising within the spectrum of **autism**. Autism is usually manifested in the first year of life. These children show signs of extreme aloneness (lack of attachment, failure to cuddle, avoidance of eye gaze) They tend to insist on sameness (resistant to change, rituals, morbid attachment to familiar objects and repetitive acts).

Adding glyconutrients is another example of the body being empowered to heal itself.

They have speech and language disorders (ranging from total muteness through delayed onset of speech to idiosyncratic use of language). They manifest uneven intellectual performance.¹⁴ These children all have learning disabilities. Autism may actually be more than one disorder. Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), Asperger syndrome, Angelman Syndrome and even Prader-Willi syndrome - just to name a few - are

now also considered within the spectrum of autism. As of 2004, the experts consider 1 in 166 American children as being autistic to some degree. Again, we can compare this with 1970 when just 4 in 10,000 American children were autistic. That's another dramatic increase. Some experts are saying that autism is of epidemic proportions. There is usually very little hope for these children and many parents are forced to institutionalize their children.

However, there is good news. Glycosupplementation has been available for more than a decade and has been introduced to autistic children. We do have scientific documentation from studies which show that autism, and the afflictions associated with autism, can improve.^{15,16} In addition, there have been many anecdotal cases reported from parents as well as from other practitioners.¹⁷



One such case that is worth mentioning involves another one of my patients, with **Prader-Willi** syndrome, who is ten-years-old and living in an institution. He was placed in the institution because he could not be handled at home. He has severe autistic behavior and has been living away from his family for years. His parents spend \$4000 each month for his care. After only six months of glycosupplementation,

his behavior has improved so dramatically that his parents are taking him out of the institution! Not only did these parents get their son back, but they also will not be so burdened financially.

So what about children with permanent neurological damage, such as cerebral palsy (CP)? This neurological disease is a broad term for a syndrome whereby something happens developmentally to damage the central nervous system either during pregnancy, at birth or in the postpartum period. The child has impairment of involuntary movement that is characteristic of CP. The condition is static, non-progressive and requires a multidisciplinary, integrated approach to management. There is no medication or cure to reverse the syndrome. Most children eventually find themselves in wheelchairs. The occurrence is approximately two in every 1000 births, so it is a syndrome that is not uncommon.

One of my patients had **ataxic cerebral palsy**. We gave her the glyconutrients starting at 28 months of age. She had cerebellum involvement from the neurological tests and MRI studies and had been diagnosed with CP at 26 months at UCLA (University of California, Los Angeles). She had low muscle tone (hypotonia), with impairment of coordination and fine motor skills. She could not sit, stand or walk and she could not speak. After only six weeks on the glyconutritional supplementation, along with chiropractic adjustments, she was able to walk and began to talk. We published the Case Report, and today, eight years later, she is in a mainstream, full-inclusion school. Her neurological impairments have reversed and she has no problems walking or talking. She is not only riding horses, but is winning equestrian events.¹⁸ With the return of the nervous system function, the pediatric neurologists at UCLA have no longer diagnosed her with cerebral palsy. She is continuing to flourish and is approaching a complete and full recovery and reversal of her affliction from birth.

One final note, there is also scientific evidence which shows that some children today are being born with a congenital inability to make glycoforms. They lack the mechanism for attaching the glyco- (or sugar), moiety to a protein. This dysfunction or disorder is otherwise known as a **congenital defect in glycosylation** (CDG), of which there are eight variants.¹⁹ One of these syndromes is CDG-1b, an hepatic-intestinal disease. Without the oral administration of 1 of the 8 monosaccharides - mannose - the condition would be fatal. Dr. John Axford, an Immunologist of the Royal Society of Medicine in England states, "These diseases are characterized by multisystem abnormalities, but central nervous system defects predominate. New clinical entities continue to surface." He goes on to state, "Although eight defects in the



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glycosylation pathway have been identified, probably only the tip of the iceberg has been uncovered. A CDG should be considered in all patients, children as well as adults, with any unexplained clinical condition."²⁰

The Basic Principle

After treating these children, seeing the results and then writing the Case Reports, it became even more clear to us that these nutrients were eminently safe. It was also clear that all our adult patients should be taught about the glyconutrients so that they could make a choice for themselves and their children, whether or not they wanted to add them to their diets. To our knowledge, while actively using these nutrients on pregnant women and children over the last 9 years, every single patient has benefited from the improved nutrition.

What's the basic principle at work?

We believe that what made the body will also heal the body. Nature is the source and the resource for all the body's essential needs. If we give the body the tools, the body will often spontaneously heal itself. We take for granted that when we cut our finger, the body heals and repairs that defect on our finger often without a trace of it remaining. That's the body at work, healing itself. Repair of damage and disease is its normal or natural function. We're built that way. Adding glyconutrients is just another example of the body being empowered to heal itself. Don't you think that if the body perfectly heals something like a wound that we can see on the outside, the body could also heal from the inside in the same way? It is all cellular activity - cells defending cells, cells repairing cells, cells making new cells. In another way, we can say it is all cell-to-cell communication, cooperation and construction.

Hope

These experiences and stories regarding glycosupplementation are seen each and every day. It is incredibly exciting and rewarding to give hope to sick children all over the world. As a doctor of chiropractic medicine, I feel as though I have something I can offer parents for their children who otherwise had no hope. That is the big word - *hope*. Most parents of terminal children feel as though everyone with a supplement, or something that will be "a miracle" for their child, is approaching them. Parents often do not want to step over that line and begin to hope desperately but foolishly, when all along everything they have read and been told is dismal.

The message to you, if you are a parent with a very sick child,

is that glyconutrients may not help your child's body to care itself, but glyconutrients will add to your child's quality of life. All the science and work done with children have indicated that, at the very least, glyconutrients will help to improve their digestion, their immunity will benefit and they will ultimately feel better as a result. That is really all we can promise. The future holds so much for these serious and unexplained symptoms of illness. Some of the top immunologists in the world have come to believe that glyconutrients will be a key factor in treating genetic conditions.

So, with the help of this book, more and more people will begin to understand how important these nutrients are for all of us. The fact is that we are all deficient. **The children of today are more deficient than we were at their age**, and we are more deficient than our grandparents were.

The science is there to show that there is great promise in the field of Glycobiology. Supplementation with these nutrients over time will gain more ground as more documentation and more human studies are undertaken and completed. This science is only a few decades old. From the growing body of knowledge, we should hope that these nutrients will surely be part of almost everyone's diet and indeed, a recommendation by many an informed and caring doctor.

The most compelling issue to deal with is the fact that these nutrients are just food. This fact should cause the world to look at health from a completely different perspective. As we have used these nutrients in practice and with many babies and children, it is rewarding to see how quickly they respond. They are the most sensitive to all things and these nutrients are no exception.

Conclusion

This chapter should help to make you aware of the great need for glyconutrients and the benefits they offer for a better quality of life. By taking glyconutrients, the children of today can help prevent future diseases in themselves and their children. It would be to our advantage also, for all of us to take responsibility for our health by doing all that can be done to optimize our own health and the health of our children.

In essence, the science of glycobiology has just been born. According to Dr. John Axford, "Most major diseases that afflict mankind (e.g., cancer, rheumatoid arthritis, heart disease, diabetes, infectious diseases and neurodegenerative diseases) directly involve glyconjugates. The ultimate goal is to develop the science of glycobiology so that

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it can have a significant impact on our ability to define and support health, and to diagnose and manage disease."²⁰

About the Author:

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Dr. Victoria Arcadi has been a licensed chiropractor for over 20 years. She broke new ground with her first controversial and courageous studies and subsequent treatments of pregnant women. Dr. Arcadi went on to co-author a book with the famed and beloved Dr. Lendon Smith, who is known as "The Baby Doctor." She was the first to publish studies regarding the utilization of glyconutritionals with genetically damaged children and those with cerebral palsy. She has earned a Diplomate degree in Pregnancy and Pediatrics.



Editors Note:

In the next chapter, you will meet a doctor who really prides herself in being a super-mom. She will demonstrate some of what you learned in the past two chapters when she relates the birth of a glyco-baby. For her family with seven children and her patients, glyconutrients has become a living reality ...