**New Concepts In Hyperactivity**

**Introduction**

Today, one out of every five children suffers from hyperkinetic behavior and related learning disorders. While psychotherapy and medication are helpful in controlling this epidemic, the inquiring person cannot help asking if there are not other areas of research that would yield answers to the tragedy of the hyperkinetic child.

**Behavior and Body Chemistry**

A vast, virtually ignored field of research is the relationship between body chemistry and hyperkinetic behavior. Psychologists traditionally have not entered this field, and medical doctors, while interested in brain chemistry, have lacked tools for screening and diagnosing many biochemical abnormalities.

**Mineral Research Yields Hyperactivity Patterns**

For the past twenty-five years we have worked with a promising new research tool, tissue mineral analysis and have had the opportunity to review over a million tissue mineral profiles, many matched with confirmed medical diagnoses. As a result, we have been able to identify several clear biochemical patterns associated with hyperkinetic behavior, and have had excellent clinical success in reducing hyperactive behavior by correcting these biochemical imbalances.

**The Stress Threshold Concept**

In this article we are not claiming that dysfunctional brain chemistry is the sole cause of hyperactivity. What is clear from our research, however, is that a disturbed brain chemistry is an important factor in many cases of hyperactivity. Biochemical factors can contribute greatly to a child's stress threshold, and if we can keep the child below a certain stress threshold, hyperactivity will not manifest.

Biochemical factors are worth looking at because they can be measured and monitored objectively, and correction can be made through simple diet changes and nutritional supplementation. Our results clearly demonstrate the validity of such an approach.

**Major Biochemical Patterns Found In Hyperactivity**

One type of headache, the migraine type, causes extreme discomfort to many people. These migraine headaches can be particularly severe and may last for days and are one of the most debilitating types of headaches. It is often preceded by a prodrome, which may include symptoms such as seeing flashing lights, a halo around objects and feelings of nausea. Women often experience migraine headaches before their menstrual period. Often a migraine headache is one-sided and the headache is made worse by exposure to light.

By combining our hair mineral research with other medical knowledge about hyperactivity, five major types of biochemical imbalances are found to be principal causes of hyperactivity, learning disability and other related disorders. These mineral patterns include;

* over activity of the adrenal glands, with resulting effects on brain chemistry,
* over activity of the adrenal glands, with resulting effects on brain chemistry,
* exhaustion of the adrenal glands, with hyperactivity as a compensatory mechanism,
* copper imbalance, or
* other toxic metals which affect brain chemistry and essential vitamin and mineral deficiencies.

Let us now discuss the characteristics, etiology and examples of each of the above.

**Overactive Adrenal Glands as a Cause of Hyperactivity**

**Characteristics of Adrenal Hyperactivity**

The adrenal glands form a major part of the sympathetic nervous systems response to stress, that being the fight-flight response. One of the effects of the fight-flight response is an increase in the metabolic rate and an increase in the speed of nervous system reactivity. The mechanisms for this are as follows:

**Loss of calcium, magnesium, and zinc -**An increase in adrenal hormone secretion causes a reduction in calcium, magnesium and zinc tissue levels. Calcium is known to raise the threshold voltage potential at which a nerve cell fire. Lowering of tissue calcium levels results in an increase in nervous excitability or irritability.

**Increased cell permeability** - Calcium is also a major regulator of cell membrane permeability. The influence of aldosterone, an adrenal gland hormone, is to increase cell permeability by raising sodium levels and lowering calcium and magnesium levels. Increased permeability of all body cells means that, cellular activators such as the thyroid hormone and glucose, pass into cells more readily, leading to increased cellular metabolic activity.

**Elevation of blood sugar** - A third mechanism for increased nervous activity is increased cortisol secretion. Cortisol, an adrenal cortical hormone, among other functions regulates the release of glucose from the liver into the blood. An increase in adrenal activity, due usually to stress, causes the body to pour sugar into the blood, like pouring gasoline on a fire. An increase in blood sugar levels enhances nervous system function and, in excess, contributes to hyperactivity.

**Hypoglycemia** - Erratic behavior and mood swings may also occur as a result of adrenal hyperactivity because of a tendency to episodes of low blood sugar or hypoglycemia. These occur because the fast metabolizer is continually converting glycogen reserves to glucose, and as a result, has relatively low liver and muscle glycogen reserves. Since the rate of metabolism is rapid, depletion of glycogen reserves can readily occur, resulting in sudden episodes of low blood sugar. Such episodes are frequently accompanied by various degrees of anxiety, nervousness, irritability, and mental confusion.

**Causes of Adrenal Hyperactivity**

**Why do some children and adults have overactive adrenal gland activity?**

**Reasons include:**

**Congenital or hereditary overactive gland function -** Some children are born with excessively hyperactive adrenal glands. Excessive hyperactivity of the adrenal glands can be due to a genetic, biochemical or neurological defect. More often, hyperactivity of the adrenal glands is due to stress-induced impaired biochemistry of the mother. Toxic metals, nutrient deficiencies, etc., are passed readily through the placenta and detrimentally affect the health

**Physical, chemical, or psychological stress** - Stress whether physical or emotional, results in a lowering of tissue calcium, magnesium and zinc levels. These are the three major minerals which by their sedative action, slows down physiological activity and prevents hyperactivity from occurring. Anything that causes stress, whether emotional or physiological, will increase one's tendency toward hyperactivity. Hyperactivity is much more prevalent in a child because the child begins life as a fast oxidizer. Fast oxidizers have higher levels of sodium and potassium and lower levels of calcium, magnesium, zinc and copper than a slow oxidizer.

**Considering the fact that so many children are born with severely low calcium, magnesium and zinc levels, and might possibly also have a low copper level, it would stand to reason that such conditions as hyperactivity, autism, learning disabilities and childhood behavioral problems would be increasingly prevalent.** Normally speaking, under stress, tissue sodium and potassium levels rise. Any agent, e.g., an infection, which is capable of eliciting a defensive response (increased metabolic rate) makes one increasingly susceptible to hyperactive behavior. As one's body adaptation mechanisms become increasingly unable to compensate, additional metabolic dysfunctions become manifest.

**Infections** - Infections are a threat to the body and as a result, serve to induce an adaptive response which includes an increase in adrenal activity. Many children suffer from chronic infections which cannot only initiate, but perpetuate hyperkinetic behavior.

Research indicates that children with a low tissue copper level along with low calcium, magnesium and zinc levels are increasingly more prone to infections and allergies.

Time after time we see hair analyses of children 4 to 10 years of age who have experienced serious infections. Hyperactivity frequently ensues. A copper deficiency frequently develops after prolonged or recurring infections leading to a vicious cycle of more infections.

**A copper deficiency may also result from the use of certain antibiotics.** Penicillin, for example, is a known potent chelator of copper. There have been reported cases of children becoming emotionally disturbed after the use of penicillin to treat chronic recurring infections. Infections exert severe stress on the body, and by increasing adrenal hyperactivity, tend to favor a speedup in one's rate of metabolism. Research reveals that chronic infections contribute to hyperkinetic behavior.

**Salt -** An excessive intake of salt is commonly associated with hypertension. We have noted that an excessive salt intake is also frequently associated with hyperkinetic behavior. Excessive chronic salt consumption favors a lowering of tissue calcium, magnesium and zinc levels, which in turn, contributes to an increase in brain activity. In the child who is close to a threshold, salt (usually from fast foods) can be the final factor to initiate and produce hyperactive behavior.

**Sugar** - Eating sugar is analogous to directly fueling the fire. Sugar is readily absorbed into the cells, resulting in a rapid increase in metabolic activity. Many parents with sugar-sensitive children, know by their child's erratic behavior when someone has fed the child a cupcake or even apple juice, which is high in sugar even if it is unsweetened

**Low blood sugar**, which can be the result of eating sugar, skipping meals, adrenal insufficiency, or due to a wide variety of biochemical imbalances, severely affects brain function, inasmuch as the brain has no sugar reserves.

The brain literally begins to run out of fuel. The body responds by increasing the secretion of adrenal hormones in order to convert glycogen to glucose. The rush of adrenalin and other hormones during a hypoglycemic episode is known to produce hyperactive behavior, mental confusion and even violence.

**Allergies** - The effect of allergens in foods, or other substances, are to increase adrenal gland activity, because allergens act as stressors. Dr. Benjamin Feingold has published excellent studies concerning the effect of food additives and colorings on certain hyperactive children.

It is important to point out that food sensitivity is not, as usually thought, the primary cause of hyperactivity. However, in a child who is near his threshold limit, food sensitivity can be the factor that precipitates hyperkinetic behavior.

By correcting body chemistry and by giving nutrients which reduce adrenal response, these sensitivities can be diminished so that strict diets, although beneficial, may not be necessary.

**Diet deficient in calcium, magnesium, or zinc** - Stress, from any cause, results in a specific loss of the minerals calcium, magnesium, and zinc. Loss of these vital minerals is associated with the fight-flight response. These minerals (in certain cases) are excreted purposely by the body to speedup cellular activity.

To recover equilibrium and normal functioning, these sedative elements must be replaced in the diet. Today many diets are deficient in these key minerals, such as a diet of lunch meats and soda pop.

The result is, the body cannot recover from stressful episodes and over a period of time the adrenal glands become chronically over-stimulated.

**Stimulants** - Most stimulants, such as caffeine, act directly or indirectly by increasing adrenal gland activity, as evidenced by a rise in sodium and potassium levels. Even excessive exposure to television or excessive noise in a household by stimulating the adrenal glands will contribute to hyperactive behavior.

**Fast oxidizer personality or temperament** - Research reveals that certain personality types respond to any stress with an exaggerated response. These children have a difficult time handling stress appropriately. They might be called high-strung or very emotional children.

**Such children readily go into the fight-flight response at the slightest provocation.** While these children do not necessarily have a biochemical problem, we find that by feeding them foods or supplements with calcium, magnesium, zinc and other sedative nutrients, which are conducive to tissue storage of the above nutrients, their exaggerated behavioral response can be beneficially modified.

Toxic levels of cadmium, mercury, iron or manganese - Elevated tissue levels of the toxic metals cadmium, mercury, iron or manganese are known to cause hyperactivity of the adrenal glands. In this way, toxic metals contribute to certain cases of hyperactivity.

**Adrenal Exhaustion as a Cause of Hyperactivity**

**Characteristics of Exhausted Adrenal Gland**

**Hyperactivity as a compensation for exhaustion** - Have you ever heard someone who is always busy say that if they ever slow down they fall asleep? These individuals are using activity as a way to compensate or defend against constant fatigue. In our research, we frequently noted that many children who were hyperactive had a low tissue sodium (aldosterone) level in relation to potassium (glucocorticoid hormones). Other research verifies that a low sodium/potassium ratio is associated with adrenal gland exhaustion.

We have also noted that many hyperactive children have telltale signs of fatigue, such as dark circles or bags under their eyes. Also, it is a common observation that when children are tired they become irritable.

**Hyperactivity and burnout** - It is only common sense to realize that many hyperactive children and overactive adults are compensating for exhausted or burned out adrenal glands. They are running on nervous energy. Usually they run a lot and accomplish little.

**These children seem very active, yet learn little in school.** They are not functioning in a natural rhythm, but are driven (running) from relentless fatigue. If they slow down or oversleep they are faced with overwhelming fatigue, and the pain of the fatigue and usually accompanying depression quickly drives them back to their unceasing activity.

**Hypoglycemia in the exhausted hyperactive child**

Just as hypoglycemia occurs in the fast oxidizer child (overactive glands), so it also occurs in those with underactive adrenal and thyroid activity, for different reasons. In these children with underactive adrenal and thyroid activity, low levels of adrenal cortical hormones (cortisone) result in an inadequate ability to convert glycogen to glucose. The result is a tendency for low blood sugar levels, especially when the child is fatigued. This creates a craving for sweets, and can directly influence behavior as well.

**Causes of Adrenal Exhaustion**

The most common causes of adrenal gland exhaustion are:

**Congenitally exhausted adrenal glands** - Many children are born today with inadequate adrenal gland function, as evidenced by a low tissue sodium and potassium level. This mineral pattern is usually inherited from the parents, particularly the mother, especially so if the mother has been over-stressed, lived on inadequate diets, or who suffered from copper or other toxic metal poisoning, which is passed on to the child.

**Over-stimulation from any cause** - A child who comes under unrelenting stress at home, who is pushed into activities, or whose intake of stimulant foods such as soda pop and sugar are excessive, is increasingly prone to exhaust his or her adrenal glands.

**Inadequate diet -** The adrenal glands specifically require manganese, zinc, pantothenic acid, vitamins A, C, and E, and other nutrients for normal functioning. Modern diets are notoriously deficient in trace elements and frequently deficient in vitamins as well. Stress also results in a depletion of these vital nutrients.

**Toxic metals** - Toxic metals are passed on from the parents, or accumulate in the tissues as a result of exposure or other mineral imbalances. Toxic metals replace vital metals in metallo enzymes, thereby interfering with normal enzyme activity. We'll look at this cause separately in the next few pages.

**Effect of medications or other toxic substances** - Overuse of prescription drugs and exposure to pesticides and other environmental toxins by depleting vital nutrients can eventually contribute to adrenal exhaustion.

**Whatever the causes of adrenal mineral exhaustion, tissue mineral analysis, properly interpreted is capable of identifying the exhausted adrenal pattern and offer ways to both prevent the hyperactive phase and solve the underlying fatigue problem.** By increasing biochemical energy production, fatigue is reduced. This then frees the child or adult to function in a normal manner, rather than having to drive themselves to keep going.

**Introduction to Toxic Metals**

**Copper Imbalance as a Cause of Hyperactivity**

Toxic metal poisoning plays a major role in the causation of hyperactivity. A major reason why toxic metals have not attracted widespread attention is that the tool to detect toxic metal poisoning, the tissue mineral analysis, is not performed routinely. In fact, hair analysis is an inexpensive, non-invasive test that could easily be performed on every school child.

To obtain the most benefit, the hair analysis must be interpreted correctly. Not all toxic metal poisoning is revealed on the first test. Some minerals are so effectively stored in various tissues and organs that it may require several months or even years before they appear in the hair and can be identified. This has been an obstacle to the use of tissue mineral testing for heavy metal toxicity, inasmuch as it can appear that the test missed the problem.

Proper interpretation of the test allows us to predict hidden copper toxicity. When a person is placed on a nutrition program, lead and other toxic metal poisoning are often revealed on the second or following test.

**Characteristics of Copper Imbalance**

Copper, in a bio-available form, is known to stimulate the biogenic amines, epinephrine, norepinephrine, dopamine, and serotonin. These are excitatory neurotransmitters, which increase brain activity. For this reason, an elevated copper level is usually associated with hyperactive behavior.

Copper toxicity enhances emotional sensitivity, thereby producing a tendency for mood swings and erratic behavior. Excessive copper displaces zinc in the body. Zinc is a stabilizer of emotions, and a deficiency of zinc is a frequent cause of hyperactive behavior.

**Causes of Copper Imbalance
Congenital high copper -** Although it is normal for children to have elevated copper levels, we find that hyperactive and learning disabled children frequently have extremely elevated tissue copper levels or indications of hidden copper toxicity. Most often, no specific cause can be found in the diet for these high levels, and we must assume that the child was born with an excessively high copper level. This is a common occurrence today, and helps explain many symptoms including hyperactivity, learning disorders, failure to thrive syndrome, recurrent infections and other symptoms associated with a copper imbalance.

The question arises, why are children born with excessively high tissue copper levels? The answer is that it is passed on from parents. When mothers bring in their hyperactive children for therapy frequently it is possible to take a case history of the mother and establish that she has excessively high copper levels. Toxic metals are known to readily pass through the placenta. The child may actually act as a sink for toxic metals that are difficult for the mother to eliminate.

**Stress** - Stress, whether acute or chronic, results in a depletion of zinc from body tissue reservoirs. Copper is antagonistic to zinc, and lower zinc levels often result in an excessive accumulation of copper in various tissues and organs.

Also, stress taxes the adrenal glands. Optimally functioning adrenal glands are required to produce adequate ceruloplasmin, a copper-binding protein. Interfering with ceruloplasmin synthesis is another way that stress can lead to copper toxicity and bio-unavailability.

**Diet** - Vegetarian proteins are relatively high in copper, as compared to meat protein. Some parents encourage or allow children to follow strict vegetarian diets, which further contributes to copper toxicity.

A very low protein diet can also contribute to adrenal insufficiency. Protein is critical to maintain and rebuild all body tissues including the endocrine glands.

**Junk-food diets** are deficient in zinc and other essential nutrients required for optimal adrenal and other vital physiologic activities. Children who consume junk foods, soda pop, and other empty calories are more prone to developing a copper toxicity problem.

**Other Causes** - Occasionally, excessive tissue copper is the result of drinking water which flows through copper water pipes, or to which copper had been added as a fungicide.

**Toxicity and Biounavailability of Copper**

Copper can be present in toxic amounts in body tissues, yet there can be a simultaneous deficiency of copper available for physiological use. This condition is known as bio-unavailability. Biounavailability of copper can occur when adrenal insufficiency results in a deficiency of the binding protein, ceruloplasmin. Low levels of ceruloplasmin allow unbound and hence unavailable copper to accumulate in vital tissues and organs.

In some hyperactive and learning disabled children with elevated hair copper levels, the copper is not available and thus, additional supplemental copper must be given to obtain optimum results.

Understanding the concept of bio-unavailability can resolve the paradox of a person having toxic copper levels, yet needing to take supplemental copper.

**Why is Copper Frequently High in Children**

Children are normally born with a high level of tissue copper. A high copper level at birth serves to protect against excessive levels of stress. A baby is born into a world of stress.

An elevated copper level serves, in part, to prevent newborns and young children from experiencing an excessive awareness of the real world. Thanks to adequate levels of copper, stress seldom reaches the conscious level. If it did, the child's emotional and mental health might be severely impaired. This explains one of the major reasons why copper levels are normally so high at birth. The stresses of life in early childhood must evidently be so great that having a high copper level is actually advantageous to survival.

**Hair Analysis Measurement of Copper Toxicity**

Copper imbalance may or may not be detectable on serum blood tests. Using a hair analysis as a testing procedure, copper imbalances (toxicity) are generally clearly defined as a level greater than 2.5, or less than 1.0 mg%.

Many times, however, copper toxicity is not obvious. Wilson's disease is intimately associated with copper toxicity and yet a high (toxic) copper level rarely shows-up in the hair of these individuals. This is due principally because copper cannot be released in normal amounts from liver and brain storage due principally to an adrenal insufficiency problem. According to our clinical research, a copper imbalance can be presumed from the following other mineral indicators on a hair mineral analysis:

* Calcium/potassium ratio greater than 30:1, or
* Potassium level less than 3 mg%, or
* Zinc/copper ratio less than 5:1, or
* copper imbalance, or
* Sodium/potassium ratio less than 2:1.2

**Other Toxic Metals as Causes of Hyperactivity**

**Lead Toxicity**

There is conclusive evidence in the medical literature linking the accumulation of lead in the tissues with mental retardation and hyperkinetic behavior in children. Lead poisoning is common not only among children exposed to lead paints, but among many adults, because lead is widely used in pesticides, gasoline additives, and in industry.

Lead toxicity is often overlooked as a diagnosis because conventional blood tests fail to identify lead stored in body tissues.

**Mercury Toxicity**

"Toxicities of non-essential elements are also well-known, and of these, mercury poisoning is perhaps the most interesting in this context. Mercury-toxic people are more prone to blushing (erethism), lose self-control easily, and are timid and easily discouraged."

**Manganese Toxicity**

"Toxicities of various metals very frequently involve considerable psychological abnormalities. The consequences of manganese toxicity in man have been studied in some detail in Chile. In addition to hypertonia, tremor of the extremities, impaired hearing, and a characteristic gait, the psychological alterations were very great. 53 percent showed emotional instability, 47 percent apathy, 40 percent hallucinations, and 27 percent disturbance of libido. The patients were miners suffering from severe manganese toxicity that was not due to excess manganese in the diet."

**Cadmium Toxicity**

Cadmium is an antagonist to zinc and displaces zinc in critical enzyme binding sites. Since zinc is one of the major sedative elements, displacement of zinc by cadmium can contribute to hyperactive behavior and concentration deficit.

Cadmium toxicity is common, and can be passed from mother to child. Once in the body, cadmium is difficult to remove. It has a half-life of between 17 and 30 years. Through nutritional therapy, however, cadmium can often be eliminated in 6 - 12 months.

**Medications and Other Toxic Substances**

Excess brain activity occurs when substances, which stimulate the brain, are present in excessive amounts, or protective nutrients are deficient. There are numerous substances which stimulate the brain such as chemicals, drugs, alcohol, marijuana, caffeine, and even a variety of vitamins and minerals.

By depleting nutrients, overuse of prescription drugs and exposure to pesticides and other environmental toxins can eventually contribute to adrenal exhaustion.

**Essential Mineral and Vitamin Deficiencies and Hyperactivity**

**Low Tissue Zinc**

Zinc deficiency is extremely common today for a variety of reasons. Refined foods are deficient in zinc, stress depletes zinc reservoirs, the soil is deficient in zinc in thirty-two of our fifty states, and many children are born deficient in zinc due to inadequate zinc reserves in their mothers.

A low tissue zinc level is associated with hyperkinetic behavior for two main reasons. Zinc itself is a sedative element, which prevents the nervous system from over-responding to stress. A zinc deficiency often leads to an excess of copper in vital tissues, inasmuch as zinc and copper have an antagonistic relationship.

**Low Tissue Calcium and Magnesium Levels**

Low tissue calcium and magnesium levels have already been discussed under causes for adrenal overactivity, but bears repeating since deficiencies of these minerals are so commonly noted in our research studies.

Although a child may drink milk and eat cheese and yogurt, this is no assurance that a calcium deficiency does not exist. Herein lies the importance of the concept of biochemical individuality. Frequently hyperactive children require three or more times the RDA or MDR of certain nutrients in order to balance his or her body chemistry.

**Low Manganese, Iron or Copper**

A deficiency of manganese has been discussed previously as a cause of adrenal exhaustion. Manganese, iron and copper are also required for energy production and optimal adrenal gland activity.

**Low Chromium**

Chromium is required for insulin transport, and serves as an important regulator of blood sugar levels. Many hyperkinetic children are sugar and carbohydrate intolerant and, as a result, are especially prone to severe mood swings.

**B Vitamins**

Specific 'B' vitamins, including thiamine, riboflavin, niacin, pantothenic acid, pyridoxine and choline, are required for optimal nervous system function and for optimal energy production. A sub-clinical deficiency of the above nutrients due to inadequate dietary intake or increased demand, can significantly contribute to hyperkinetic behavior.

**Implications And Conclusions From Biochemical Research**

**Why Hyperactivity Runs in Families**

Frequently, more than one child in a family exhibits hyperactive behavior, and it is becoming increasingly common that a child of a mother who was hyperactive will display many of the same symptoms as the parent. It is tempting to attribute this to chance or to heredity. Our research indicates, however, that this is not always the case.

Instead, it is clear from our testing procedure that mineral imbalances are passed from parent to child across the placenta during pregnancy. A mother who has elevated copper and low zinc, for example, will pass that pattern or tendency on to her child.

The positive aspect of this phenomenon is that the hyperactivity mineral patterns are usually not in the child's genes, but simply present in the child's body chemistry and subject to correction by nutritional means.

**Hyperactivity in Adults**

We think of hyperactivity as a phenomenon of childhood, but in fact, it is as common in adults as in children. The manifestations are simply more veiled and subtle.

Some symptoms of hyperactivity in adults include: constant talking, fidgeting and nervousness, inability to relax, inability to concentrate or finish a thought, excessive irritability, excitability and insomnia. Delinquency, violent behavior, and other anti-social behavior are also often adult manifestations of a hyperactivity condition.

Adults may express deviant behavior in less obvious, or more private ways than children, but the effects on themselves and on society are no less devastating. Fortunately, adults respond well to corrective nutritional programs.

**Why and How Medications are Effective in Controlling Hyperactivity**

A seeming paradox in the medical treatment of childhood hyperactivity is that the most effective medication is methylphenidate hydrochloride (Ritalin), a stimulant drug. The paradox is that when given to hyperactive children it has a sedating action.

This paradox can be resolved by referring back to one of the biochemical patterns associated with hyperactivity, a low sodium/potassium ratio. This is a critical mineral ratio related to many metabolic dysfunctions.

Ritalin appears to act as a stimulant to adrenal gland activity, and its effect on the tissue minerals is to raise sodium levels. If a child has a low sodium level in relation to potassium, administering Ritalin will tend to temporarily normalize the sodium/potassium ratio, or temporarily improve adrenal gland function. The improved adrenal gland activity provides the child with more energy to cope with stress and hence, he is able to calm down. This concept can serve to explain the seeming paradox of why a stimulant would help someone calm down.

**Why we Recommend Use of Hair Analysis**

Certain minerals and vitamins such as manganese, vitamin B-1, C and E, when given in proper dosage, have similar effects upon mineral ratios and adrenal gland activity, as does Ritalin, without the side effects of Ritalin.

Through a nutritional approach we can identify which of the three or more hyperactivity patterns a particular child has, and provide the appropriate nutritional treatment for each pattern. This highly specific correction of body chemistry improves the success rate.

**Widespread Hyperactivity and Learning Disorders: A Reflection of Modern Values**

The number of children born with severe mineral imbalances has reached near epidemic proportions. Thousands of children born today will never experience robust health, and some are severely exhausted before they even enter school. They often never attain anywhere near their full potential because of a poor biochemical start in life. They are prone to become involved with drugs, promiscuity, delinquency, and even suicide because of their exhaustion and the mental anguish arising from a deviant body chemistry.

**Conclusion**

Our research indicates that adrenal gland insufficiency, toxic metal poisoning and nutrient deficiencies contribute significantly to hyperactivity and learning disability disorders.

In conjunction with other types of therapy, correction of the mineral balance and the entire body chemistry can enable many hyperkinetic children to live a full and normal life.

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