DISCLAIMER

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The information contained herein includes both psychological and non psychological interventions. The delivery of psychological services requires a medical referral whilst non psychological services do not.

Each person is an individual and has a unique psychological profile, biochemistry, developmental and social history. As such, advice will not be given over the internet and recommendations and interventions within this website cannot be taken as a substitute for a thorough medical or allied health professional assessment or diagnosis.

Date Document Updated : March 2008

Autism

Article QUICK LINKS :

INTRODUCTION

Autism is a profound and poorly understood developmental disorder that severely impairs a person's abilities, particularly in the areas of language and social relations. Autistic children are typically normal in appearance and physically well developed. Their disabilities in communication and comprehension range from profound to mild.

Currently (2007), there has been an exponential increase in the number of new diagnoses of autism. And there is continuing debate and controversy as to what the diagnosis / term / box 'autism' actually constitutes. There is even more debate and controversy as to its causes, and potential for treatment amelioration.

Between the years 1987 and 1998, the latest figures available form the California Dept of Developmental services reported a 273% increase in diagnosed cases of autism. Studies in Florida, Illinois, England , Iceland, Japan and Australia have all recorded much higher incidence rates than previously assumed.

Disability from the disorder varies in the extreme. Some autistic persons require constant supervision and assistance, even permanent institutionalisation. Others attend regular school, find jobs, lead independent lives and their affliction may not even be noticed by other people. Autistic savants (displaying extraordinary skills in the areas of mathematics, art, music and the ability to memorise data), attract a great deal of attention from the media and general public. Less than 1% of the general population are capable of such feats, but the incidence of such abilities in the autistic population is 10%. No one knows why this occurs. Some consider it is a result of highly concentrated focus on a specific area of interest.

So far, the search for the cause of autism, focuses upon genetics and environmental factors (viruses or chemicals). There is little doubt that genetics plays a part. 75% of autistic people are male, and generally, when females are afflicted, they are more severely impaired. A family with one child with autism has a five to ten percent chance of having another child with the disorder.
A family with no autistic children has a 0.1-0.2 % chance of having a child with autism. The consensus of opinion of mainstream autism researchers would indicate that the disorder results from neurological problems occurring during prenatal development or within the first years of life whilst neural connections are still being made.

In order to put the above into perspective, we will first have a look at standard medical texts to see what is 'defined' as 'autism'.

We will then look at observations in the clinical and research settings, and from there look to what can be done, with our present understanding, to prevent this disorder escalating more than it already has in our toxic environment.

MEDICAL TEXT DEFINITIONS OF 'AUTISM'

According to the Diagnostic and Statistical Manual, Fourth Edition, published in 1994 (DSM IV - A manual of criteria for diagnosis written by the American Psychiatric Association.), Autistic Disorder is listed as one of a sub-class of disorders classified under its criteria as a pervasive developmental disorder. In children with this particular Pervasive Developmental Disorder there is substantial delay in communication and social interaction associated with development of "restricted, repetitive and stereotyped" behaviour, interests, and activities. The DSM IV, identifies five different disorders referred to collectively as the pervasive developmental disorders (PDDs).

The Following excerpt is from Behave Net Clinical Capsules2 concerning DSM IV diagnostic criteria of 'Autistic Disorder'.

"DSM IV Diagnostic criteria for 299.00 Autistic Disorder

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):

1. Qualitative impairment in social interaction, as manifested by at least two of the following:
    a. Marked impairment in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction.
    b. Failure to develop peer relationships appropriate to developmental level.
    c. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest).
    d. Lack of social or emotional reciprocity

2. Qualitative impairments in communication as manifested by at least one of the following:
    a. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime).
    b. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others.
    c. Stereotyped and repetitive use of language or idiosyncratic language.
    d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level.

3. Restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:
    a. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus.
    b. Apparently inflexible adherence to specific, non-functional routines or rituals.

c. Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements).

d. Persistent preoccupation with parts of objects.

4. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years:

   a. Social interaction,

   b. Language as used in social communication, or

   c. Symbolic or imaginative play.

5. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

The Merck Manual of Diagnosis and Therapy lists autism under the heading of a "Psychiatric Condition of Childhood and goes on to define it as "A syndrome of early childhood characterised by abnormal social relationships; language disorder with impaired understanding, echolalia and pronominal reversal (particularly using 'you' instead of 'I' or 'me' when referring to one's self.); rituals and compulsive phenomena (an instance of the preservation of sameness); and uneven intellectual development with mental retardation in most cases"

THE REALITY…

The aetiology of autism is multi-factorial and temporally (timing) related to the child's development from conception.

Autism is the most frequently occurring form of pervasive developmental disorder (PDD)4

Autism is characterised by impairments or delays in social interaction and language, a lack of skills necessary for imaginative play and fantasy, repetitive patterns of behaviours, with an onset generally, prior to 3 years of age.

Currently, approximately 80% of children with autism also have some degree of mental retardation and most do not reach independence as adults.4 Their most distinctive feature, however - which helps distinguish them from individuals who are solely mentally retarded - is that they seem isolated from the world around them.

Autism manifests uniquely in the individual as a cluster of symptoms which are rarely the same from one person to another

Researchers continue to work to clarify the confusion and controversy concerning the nature, causes, methods of diagnosis, and treatment of autism. Current research has uncovered subtle differences in the onset and development of symptoms, and different types of autism have been described.
Generally speaking, an autistic child is out of touch (or perhaps too in touch) with their environment.

DEFINING 'AUTISM' IN THE CLINICAL SETTING

In clinical presentation, autism appears to occur as a "spectrum" or "continuum" of disorders (Hence Autistic Spectrum Disorders or ASD) and has, at this stage of our scientific, medical and naturopathic knowledge, an 'unknown' aetiology.

Current knowledge of the disorder has led most researchers, clinicians and therapists to believe that not only is the disorder on a continuum, but it is the manifestation of the combined interaction of genetics, the environment and the insults that the individual's immunologic, gastrointestinal and neurological systems have received from our toxic environment in the early stages of their development.[5]

Both clinical experience and the latest scientific research from institutions and organisations worldwide agree that Autism is neurobiological in aetiology and time critical. Not only in the manner of onset, but also for the potential for optimal intervention.

The following journal article sets out to investigate and attempt to quantify the effects of environmental exposures on child development.

Environmental Health Perspectives Volume 113, Number 10, October 2005 Principles and Practices of Neurodevelopmental Assessment in Children: Lessons Learned from the Centers for Children's Environmental Health and Disease Prevention Research.

http://ehp.niehs.nih.gov/docs/2005/7672/abstract.html

The fundamental lesson learned from studies of the effects of environmental exposures to the foetus and child is that the developing brain is one of the organs in the human body most sensitive to damage. Functional manifestations ranging from frank mental retardation to milder learning disabilities are the most common class of birth defects (Lipkin 1991).

See the article Stages of Brain Development for more information about the development of the human brain from conception to birth; and the article Sensory Motor Integration for information as to landmarks of motor development from birth to adolescence.

Autistic Spectrum Disorder is diagnosed by the inherent behaviours, however, the physical symptoms, pathology and neurobiology can be directly correlated to those behaviours.

Commonly, these behaviours may include:

- Before the age of three, shows delays or regression (permanent loss of previously acquired abilities) in social interaction and language skills.
- May show repetitive movements of a part or all of the body (rocking, tapping, head banging, self stimulation).
- At any age shows a lack of spontaneous, imaginative play appropriate to age.
- Shows poor or limited 'non verbal' behaviours, such as eye contact, facial and body expressions.
- Has difficulties making friends and reciprocating socially or emotionally (may not appear interested in showing and telling you things).
- Has difficulties with speech and limited use of gestures (if language is developed, conversational skills are still poor).
- Shows restricted patterns of behaviour, interests and activities (preference for repetition and sameness - behaviour may be ritualised).
- May be preoccupied by certain objects or their parts

Most autistic children are not diagnosed until 2 to 4 years of age, delaying crucial early treatment and intervention. Said Dr. David Marks, M.D.in a widely publicised interview on US television.

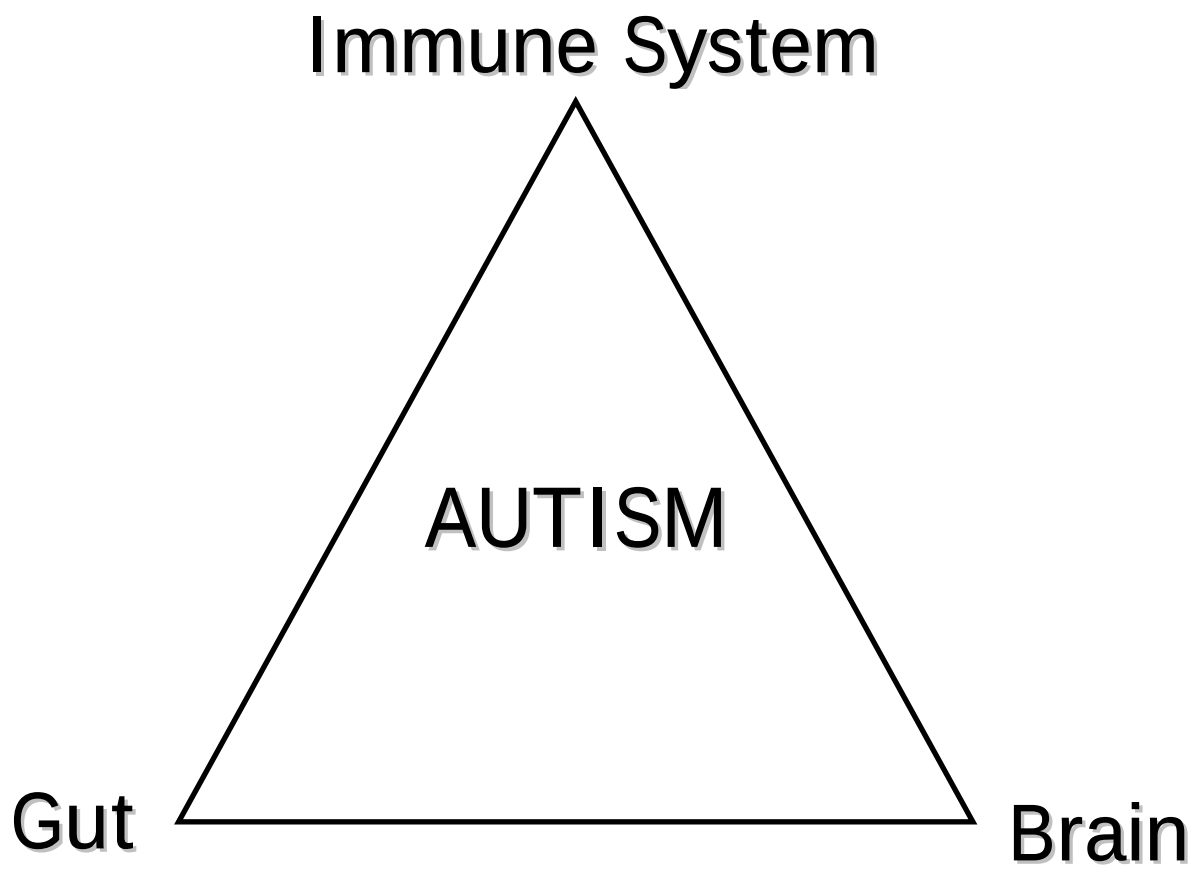
http://wcbstv.com/video/?id=89103@wcbs.dayport.com

Autistic behaviours may appear as early, or sometimes earlier than 8 months of age. Many paediatricians however, are reluctant to diagnose prior to the age of three.

In what has become known amongst clinicians as ‘classical autism’, the child is born with a compromised immune system, a compromised gastro-intestinal tract and as a consequence of the above, compromised neurological function.

Regressive autism occurs when there has been ‘normal’ development of faculties to a point in time and then an acute loss of function occurs. Usually, this is a result of toxic insult to the immune, gastro-intestinal and consequently, the neurologic systems of the body.

INTERACTIVE FACTORS



From Gupta, 2002 Mind of a Child Conference, Sydney

An increasing body of evidence now points to the role of the gut in optimal brain function and behaviour.

Many recently published books highlight the gut-brain connection in Autism, ADHD, Learning Disabilities, Schizophrenia, Dyspraxia, Depression, and Dyslexia including:

- “Gut and Psychology Syndrome (GAPS)” Dr Natasha Campbell-McBride, neurologist and nutritionist.
- “Children with Starving Brains” by Dr Jaquelyn McCandless, psychiatrist and neurologist.
- May show repetitive movements of a part or all of the body (rocking, tapping, head banging, self stimulation).
- "Is Your Child's Brain Starving", by Dr. Michael R. Lyon, M.D.
- "They Are What You Feed Them", by Dr. Alex Richardson, Senior Research Fellow, Department of Physiology, Anatomy and Genetics, University of Oxford; and Founder/Director of FAB (Food And Behaviour) Research.

Clinicians and researchers in the field of Autism Spectrum Disorders (ASD), ADHD and associated learning and behavioural disorders are now in the midst of a paradigm shift.

This shift involves discarding old beliefs and myths around ASD and acknowledging that these children are medically sick

Clusters of symptoms affecting this axis may include:

- Central Nervous system (Neurologic) problems
- Altered sensory sensitivity - Children with autistic disorder often present with hyper or hypo sensitivity to the senses of taste, smell, touch, pain, light, sound etc. That is, an abnormal processing of sensory input.
- Altered anatomic and architectural differences in brain structure.

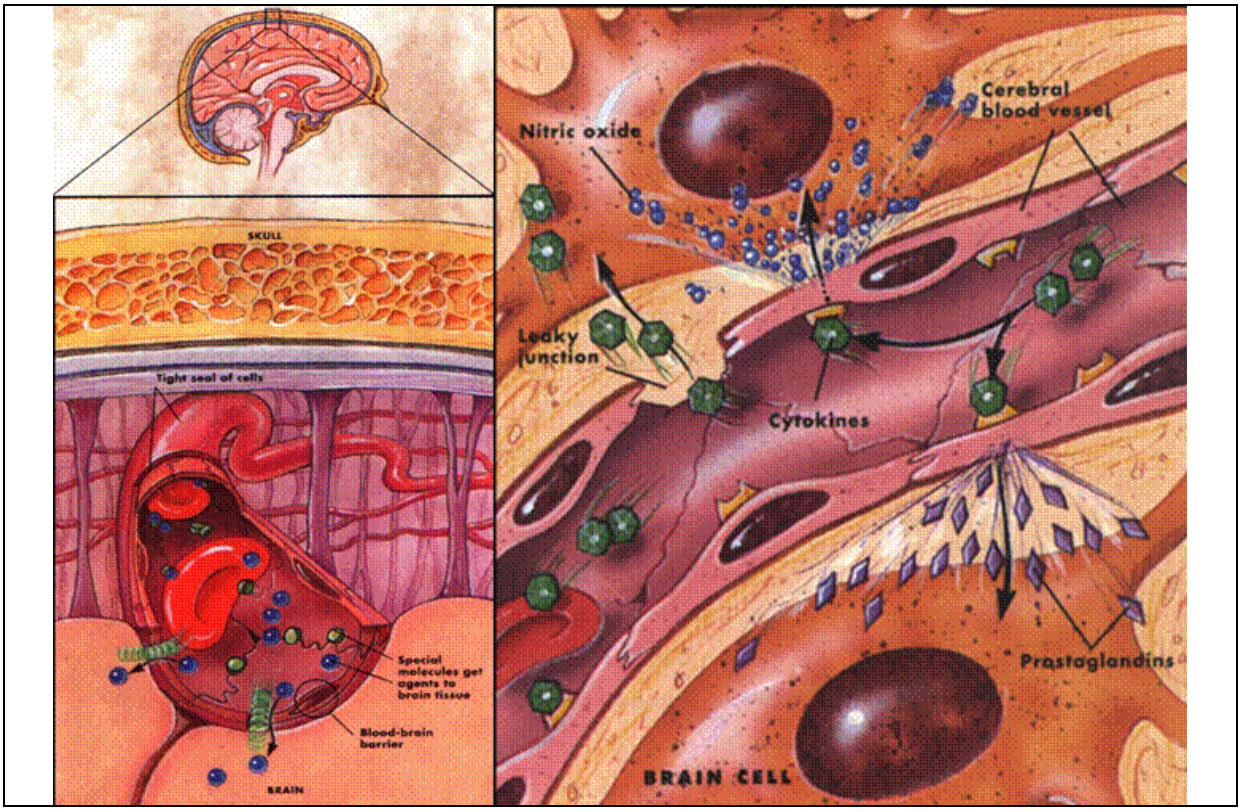
Neuronal development is a delicate and intricate process and may be interrupted in autistic individuals due to toxic insult at time critical stages of development.

THE BLOOD BRAIN BARRIER

One dogma that still persists is that the blood brain barrier protects the brain at all times and lets nothing through that may be detrimental.

Whilst it does protect the brain to a certain extent from exogenous insult, we now know that the blood brain barrier is not as effective as we used to think.

The integrity of the blood brain barrier can be compromised (by whatever means in development and growth) and gaps may form between the cells allowing toxins to enter directly via the blood stream causing inflammation of neuronal tissue.



If insult at critical stages of embryonic and early development occurs as illustrated in the Stages of Brain Development article, deficits in cognitive function will occur.

Recent neuroscience research in this area of early development of the foetus into detection of developmental delay and autism has found that three times the amount of placental trophoblast inclusions were found in the placental tissue of those children born with developmental problems than in controls. ("Placental Trophoblast Inclusion in Autism". Anderson et al., Biological Psychiatry, epublished June 23, 2006.)

Interpretation and Implications of this finding:

- May reflect underlying developmental problems
- May point to certain molecular alterations
- If replicated may be useful as part of a multi marker risk assessment panel

(George M. Anderson, Ph.D. Child Study Centre,Yale University School of Medicine, New Haven, CT, USA - at the The Interdisciplinary Council on Developmental and Learning DisordersTenth International Conference, Tysons Corner, Virginia - November 10, 2006. "Perinatal Factors & Early Biomarkers in Autism: Past Findings and Future Prospects").

The Summary of "Findings and Future Directions" of this lecture concluded that further studies to be undertaken should include:

- Examining the utility of platelet serotonin and related measures in predicting autism
  - Measure serotonin and its metabolite (5-HIAA) in newborns, infantsand toddlers.
- Careful study of melatonin production in autism
  - Replication of preliminary findings of decreased melatonin.
  - Examine the relationship to hyperserotonemia (Unusually large amounts of serotonin in the circulating blood) and to behaviour
- Other potential measures
  - Cord blood (neurohormones, testosterone)
  - Amniotic Fluid (5-HIAA, testosterone).

AUTISM AND THE BRAIN

The brain is not a static entity. It responds to drugs, to foods, to exercise, to hormones, to nutrients. It is composed of innumerable cells which perform a wide variety of functions. It reacts, it repairs, it is dynamic, it is living.

Some researchers have noted that the autistic brain has smaller memory (amygdala), emotion (hippocampus) and learning centres (cerebellum) than normal. The autistic brain does not seem to function at all like a normal brain. Neuroscientist, Eric Courchesne and colleagues have used deep brain scans to show that the fusiform gyrus (part of the brain involved in face recognition) isn't active in autistic children. Other studies report dysfunction in the parietal lobes and the corpus callosum. The anatomical and functional abnormalities strongly suggest dysfunctional genes and misguided development. So far, a gene called WNT2 and another called HOXA1 (both involved in early brain development) and a third gene that codes for serotonin are likely candidates. It is estimated that 10 or more genes may ultimately be implicated.

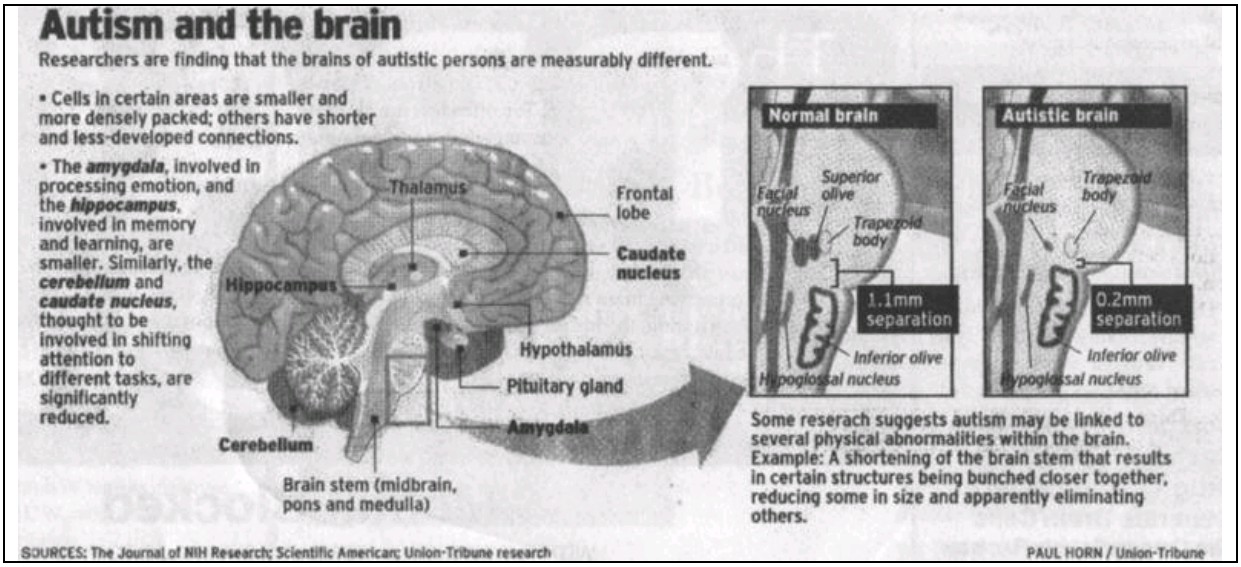
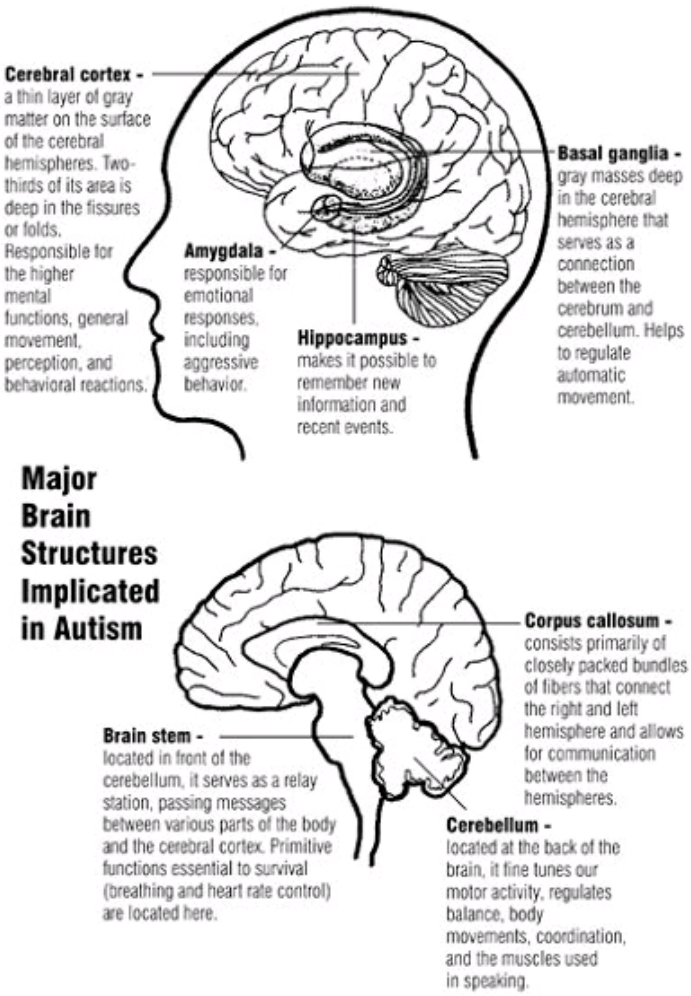


Image Source : "The Brain In the News" The Dana Foundation, 2002

STRUCTURAL IMAGING STUDIES REVEAL

- Cerebral atrophy.[7]
- Ventricular Dilation.[1]
- Abnormal ventral temporal cortical activity during face discrimination among individuals with autism and Asperger's Syndrome.[9]
- Various abnormalities of cellular migration.[10]
- Anterior and medial temporal lobe abnormalities.[11]
- Decreased neuronal size and increased cell packing density has been observed in thehippocampus, entorhinal cortex and amygdala suggesting cells are fixed at an earlier stage of brain maturation.[16]


Cerebral cortex - a thin layer of gray matter on the surface of the cerebral hemispheres. Two-thirds of its area is deep in the fissures or folds. Responsible for the higher mental functions, general movement, perception, and behavioral reactions.
Amygdala - responsible for emotional responses, including aggressive behavior.
Hippocampus - makes it possible to remember new information and recent events.
Basal ganglia - gray masses deep in the cerebral hemisphere that serves as a connection between the cerebrum and cerebellum. Helps to regulate automatic movement.
Major Brain Structures Implicated in Autism
Corpus callosum - consists primarily of closely packed bundles of fibers that connect the right and left hemisphere and allows for communication between the hemispheres.
Brain stem - located in front of the cerebellum, it serves as a relay station, passing messages between various parts of the body and the cerebral cortex. Primitive functions essential to survival (breathing and heart rate control) are located here.
Cerebellum - located at the back of the brain, it fine tunes our motor activity, regulates balance, body movements, coordination, and the muscles used in speaking.

NEUROLOGICAL NETWORKS IN AUTISM

Some researchers believe that autism is a result of a dysfunctional networking between brain regulatory centres as indicated in the following diagram.

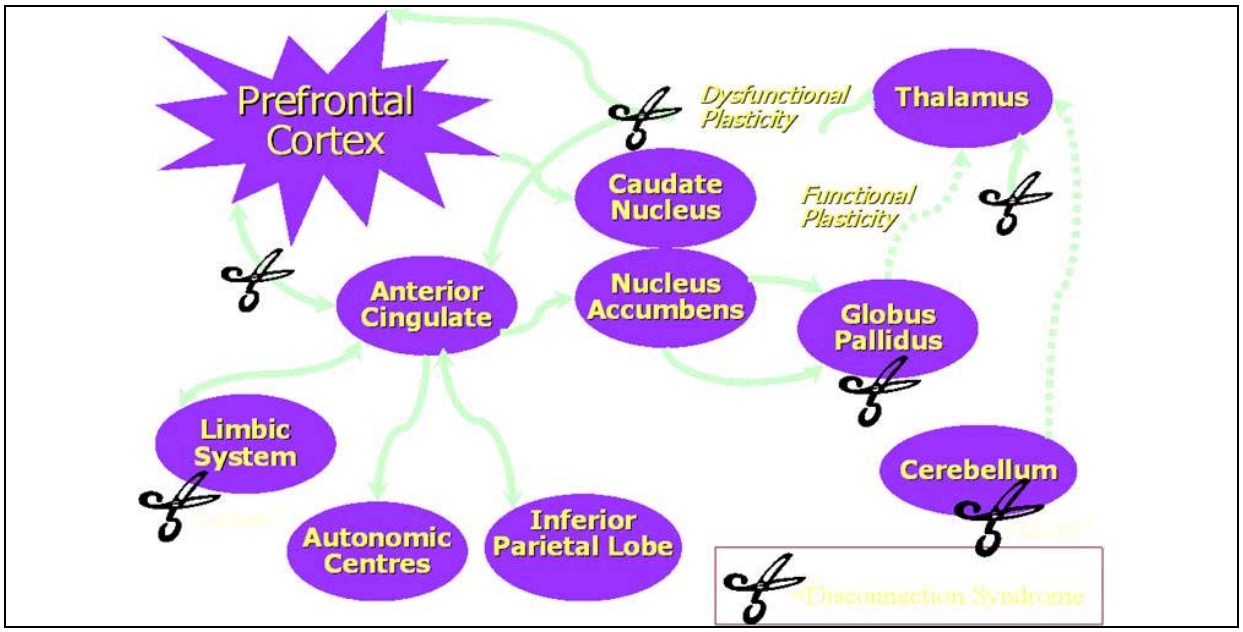


Image Source : Zimmerman & Gordon - "The Core Deficit in Autism and Disordersof Relating and Communicating" - The Journal Of Developmental and Learning Disorders Special Edition Volume 5Number 1 2001

Recent research has shown that autistic disorders have as their basis disturbances in neural connectivity - some brain regions reveal hyper-connectivity or coherence and others hypo.

Connectivity / coherence guided neurofeedback is capable of significantly remedying these functional anomalies and reducing symptoms of autism. QEEG guided Neurofeedback should therefore be incorporated in their treatment planning.

MIRROR NEURONS AND AUTISM

Mirror neurons, discovered in the late 1990's, are a subset of neurons that are activated when an individual performs certain actions as well as when we observe another performing the same actions or movements. These neurons provide a direct internal experience and therefore understanding of another person's act, intention or emotion.

They appear to underlie the ability to imitate another's action, and thereby learn. The 'mirror mechanism' is a bridge for communication and connection on several levels.

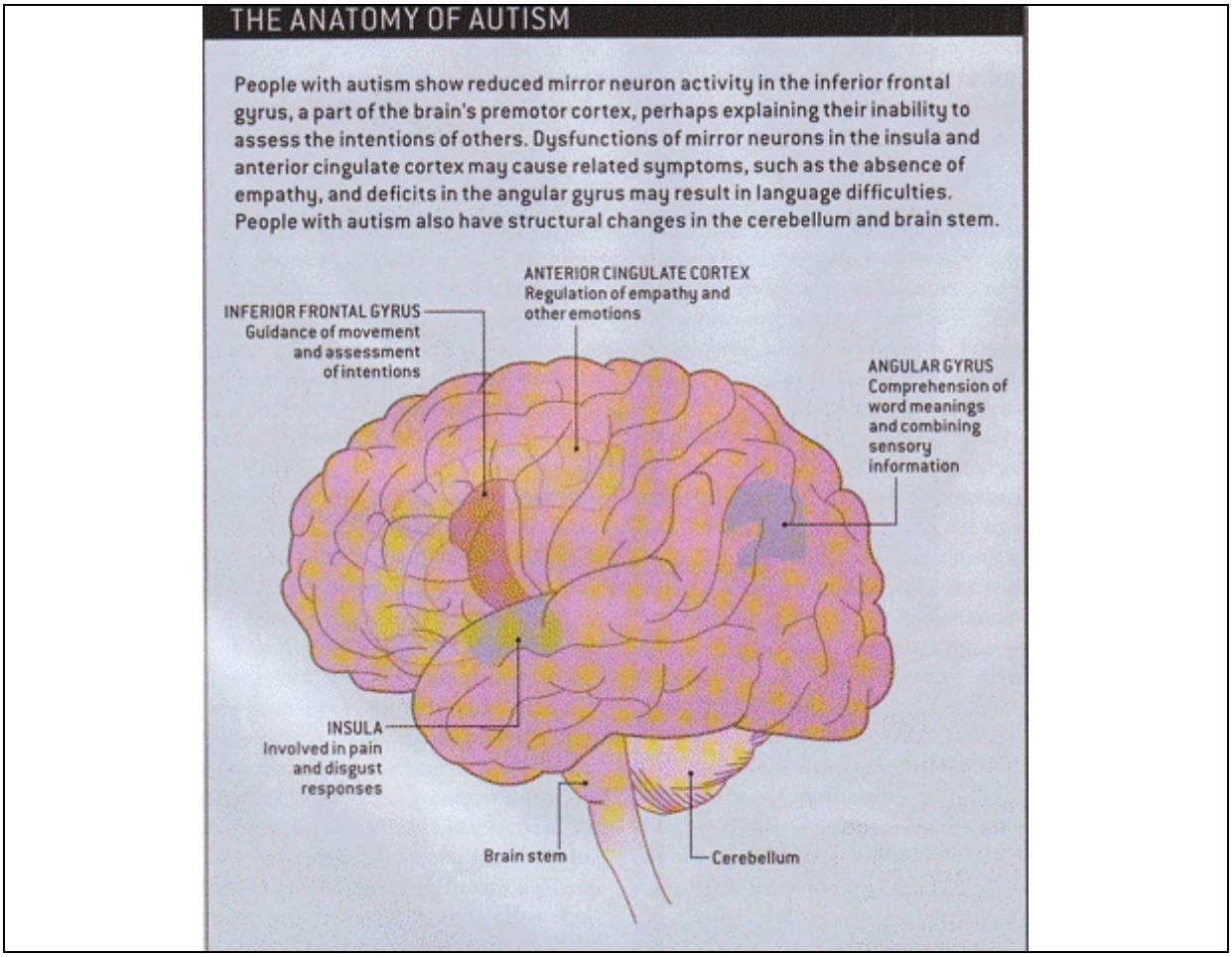


Image Source : Scientific American - November, 2006

- Mirror neurons appear to be involved in social interaction. Dysfunction in this neural system may explain some of the primary symptoms of autism including isolation and absence of empathy.

- Studies of people with autism reveal a lack of mirror neuron activity in several brain regions. Researchers speculate that intervention designed to restore this activity could help to alleviate some autistic symptoms.

Vilayanur S. Ramachandranand Lindsay M. Oberman have investigated the links between autism and the mirror neuron system at the Center for Brain and Cognition at the University of California, San Diego. Their studies conclude that the mirror neuron system is dysfunctional in autistic individuals. In their studies they correlated the 'mu' brainwave pattern (8-13 Hertz) as a means of estimating the level of dysfunction of that system.

When studying a high functioning autistic child's electroencephalograph (EEG), "The EEG showed that the child had an observable mu wave that was suppressed when he made a simple, voluntary movement, just as in normal children. But when the child watched someone else perform the action, the suppression did not occur. We concluded that the child's motor command system was intact but that his mirror neuron system was deficient". Studies have since been replicated around the world.

Jaime A. Pineda, a colleague of Ramachandran and Oberman is pursuing this approach utilising neurofeedback, and his preliminary results as presented at this year's (September, 2007) International Society For Neurofeedback and Research Conference look very promising.

The use of EEG Biofeedback (Neurofeedback) to improve autism via the mirror neuron system, or at least alleviate some of its symptoms involves monitoring the mu waves ofa child with autism and displaying them on a screen in front of the individual. If the child's mirror neuron functions are dormant rather than completely lost, it may be possible for him/her to revive this ability by learning over time, through trial and error and visual feedback, how to suppress the mu waves on the screen.

Neurofeedback should be administered together with the traditional behavioural-training techniques and other multidisciplinary approaches as discussed in this article in order to address the many aspects of dysfunction exhibited in the autistic spectrum of disorders.

POTENTIAL HERBAL INTERVENTION AS AN ADJUNCTIVE IN ADDRESSING THE MIRROR NEURON SYSTEM DEFICITS OBSERVED IN AUTISM

Club Moss - Huperzia serratais a Chinese herb traditionally used as a diuretic, sedative and antispasmodic; it was used among the elderly to improve memory. It is from the Lycopodium (Lycopodiaceae) family now used in Western herbal medicine that has been shown to promote the outgrowth of neurons' dendrites. Club Moss enhances the function of neurotransmitters and has been shown to help increase Acetylcholine levels (due to the Huperzine A content of Club Moss inhibiting the acetylcholinesterase enzyme that degrades Acetylcholine). Huperzine A has proven to be a valuable adjunctive intervention in Alzheimer's Disease. (Acetylcholinesterase is over-active in Alzheimer's Disease patients).

Clinical studies have determined that 82% of Alzheimer's Disease patients receiving Huperzine A experience memory and learning improvement. 75% of carers reported that their charges experience SIGNIFICANT memory improvement. (Kozikowski, A. P., et al. Huperzine A possible lead structure in the treatment of Alzheimer's disease. In: Advances in Medical Chemistry, Vol 1. JAI Press Inc. Greenwich, Connecticut, USA, 1992, pages 172-205).

Toxicology and efficacy studies have shown that Huperzine A is non-toxic even when administered at 50 - 100 times the human therapeutic dosage. Unlike other cholinesterase inhibitors, Huperzine A (desirably) does NOT bind to Muscarinic M1 nor Muscarinic M2 Receptors. Huperzine A is very effective in crossing the blood-brain barrier, and maximum levels of Huperzine A occur in the brain at 1.3 hours after its ingestion.

In light of the principle ingredient of the herb promoting dendritic outgrowth, Club Moss, amongst many other herbs which have direct effect upon the central nervous system and cognition, may be a candidate as a useful adjunctive in autism, developmental delay, brain injury and specific learning disabilities. Studies need to be done.

A complementary hypothesis to the mirror neuron system - the salience landscape theory - could account for some secondary symptoms of autism such as hypersensitivity.

One group of researchers decided to explore the possibility that children with autism have a distorted salience landscape, perhaps because of altered connections between the cortical areas that process sensory input and the amygdala or between the limbic structures and the frontal lobes that regulate the resulting behaviour. As a result of these abnormal connections, any trivial event or object could set off an extreme emotional response: an autonomic storm in the child's mind.

This hypothesis would explain why children with autism tend to avoid eye contact and any other novel sensation that might trigger an upheaval. These distorted perceptions of emotional significance might also explain why many children with autism become intensely preoccupied with trifles such as train schedules while expressing no interest at all in things that most children find fascinating.

Their findings, observing galvanic skin response or skin conductance, indicated that children with autism tend to have a much higher level of autonomic arousal than normal children.

Therefore any approach which aims at balancing autonomic function such as gentle bodywork therapies, will be beneficial to autistic individuals.

IMMUNE SYSTEM DIFFICULTIES COMMON IN AUTISM

Altered sensitivity to: toxins (pesticides. gas-off from building materials and furnishings, preservatives, food colourings, flavour enhancers, processed food additives), foods (gluten, casein, yeast, sugar, salicylates), heavy metals (mercury, cadmium, arsenic, lead, aluminium etc), infections (bacterial, viral, yeast), vaccinations

Abnormal processing autoimmune dysfunction, fungal, bacterial and viral infections

Autistic individuals appear to be particularly susceptible to candidiasis candida albicans: a yeast overgrowth with the potential to breach the bowel and cause intestinal permeability. Candida has the potential to turn from yeast to a fungal infection and the rootlets grow into the intestinal barrier and attach themselves to nervous tissue.[20] See Intestinal Permeability section later in this article.

DIGESTIVE ABNORMALITIES COMMON IN AUTISM

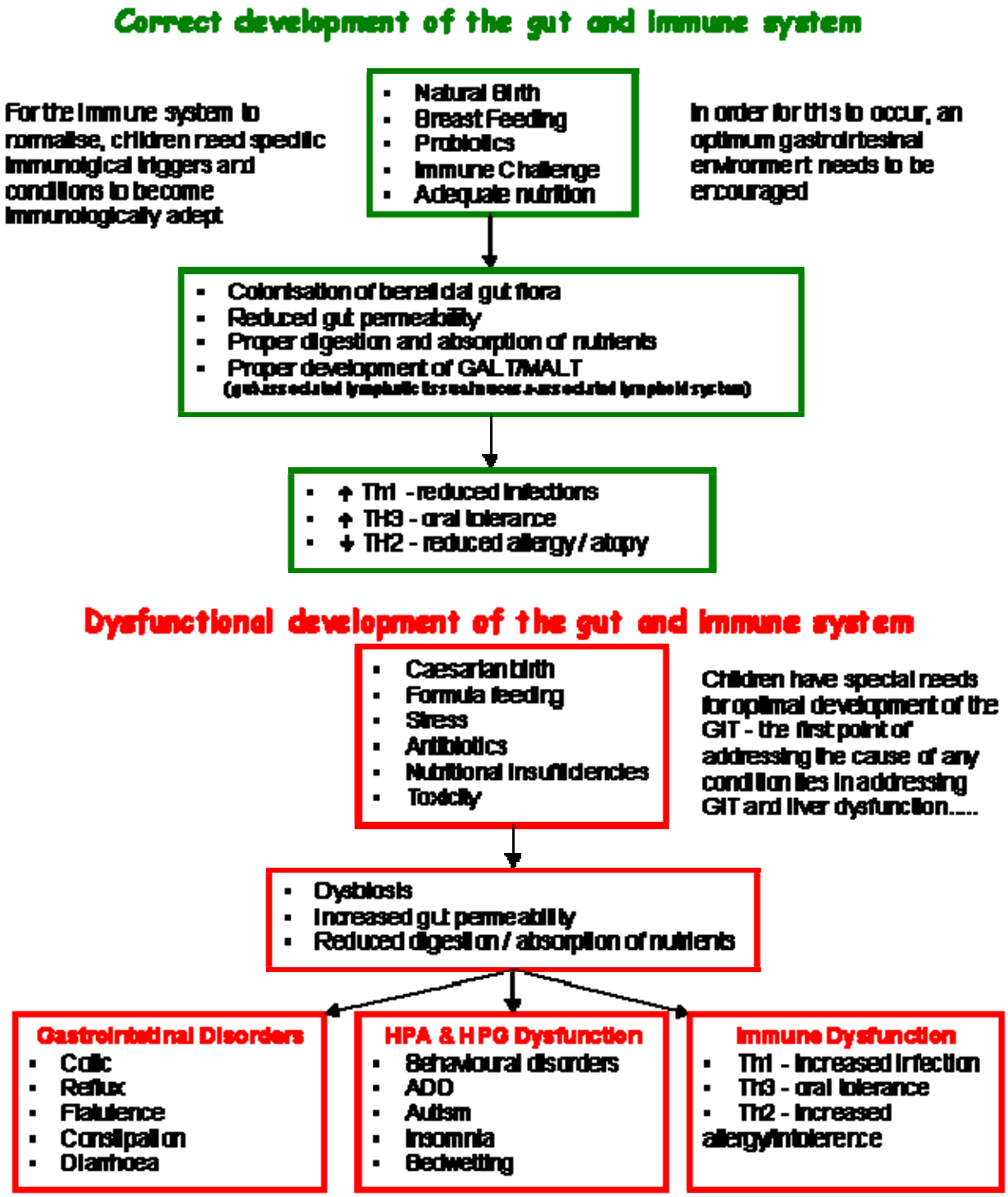
- Altered enzyme function
- Changes in bowel flora: increased harmful (toxic) bacteria
- Increase in intestinal permeability to antigens, peptides and toxins

BIOCHEMICAL PECULIARITIES IN AUTISM

- Defective detoxification leading to toxic overload is common in autism, therefore support of detoxification pathways liver etc. is desirable.

METABOLIC AND NUTRITIONAL DEFICIENCIES IN AUTISM

The following diagrams are reproduced with kind permission from'Metagenics Australia' and are from the February 2003 Metagenics Seminar, Sydney: "Management of common childhood Illnesses Due to Dysfunction of Immunological and Neurological Systems"



INTESTINAL PERMEABILITY

Intestinal Permeability is an ailment of the digestive system characterised by the inability of the intestines to prevent the “leakage” of large particles (Antigens) through the intestinal wall into general blood circulation.
It is universally found in autistic individuals.

Intestinal permeability is a poorly recognised but extremely common problem. It is rarely tested for. Essentially, it represents a hyperpermeable intestinal lining whereby large spaces develop between the cells of the gut wall, and bacteria, toxins and food leak in to where they shouldn’t.

If the gut is not healthy, neither is the rest of the body. It is the point of fuel and nutrient entry. (See earlier comment regarding the gut/brain connection).

In some cases of intestinal permeability whole bacteria, the toxins produced by bacteria (endotoxins orLipopolysaccharides) and other antigens are able to permeate the intestinal wall or gastric mucosa and enter the lymph glands, lungs, liver and other organs where they produce various diverse ailments. When the antigen is a microorganism, this phenomenon is known as microbial translocation (when the microorganism is bacteria, the phenomenon is known as bacterial translocation).

During intestinal permeability, the epithelium of the villi of the small intestine becomes inflamed and dysfunctional impeding absorption of essential nutrients.

THE FOLLOWING SUBSTANCES MAY CAUSE INTESTINAL PERMEABILITY

CARBOHYDRATES

- Excessive consumption of simple sugars may cause intestinal permeability.[8]

MICROORGANISMS

Candida albicans overgrowth (Candidiasis) may cause intestinal permeability (this occurs via the Acetaldehyde produced by candida albicans damaging the epithelial cells of the small intestine).[9]

Some types of detrimental protozoa may cause intestinal permeability:

- Blastocystis hominis may cause intestinal permeability.[2]
- Yersinia enterocolitica may cause intestinal permeability.[12]

PHARMACEUTICAL DRUGS

Methotrexate may cause intestinal permeability.[23]

Non-Steroidal Ant-Inflammatory Drugs (NSAIDS) such as Ibuprofen may cause intestinal permeability (by inhibiting certain Prostagladins that normally protect the intestinal wall.[24]

Pharmaceutical Antibiotics may cause Intestinal Permeability (by killing the layer of Beneficial Bacteria that reside in the Mucous Layer of the Intestinal Wall).[26]

POTENTIAL HERBAL INTEVENTION TO ASSIST IN HEALING THE GUT

The herb, *Hydrastis Canadensis* (Golden Seal popularly), may be a candidate as an adjunctive in nutritional and biomedical treatment of the intestinal inflammation and permeability seen in the autistic population and is used in traditional Western herbal medicine as a trophorestorative for mucous membranes. Additional properties of Golden Seal are said to be antihaemorrhagic, anticatarrhal, antimicrobial, bitter tonic, anti inflammatory, depurtive, vulnery, choleretic and reputed oxytocic actions.

It is used traditionally for such conditions as skin disorders, dyspepsia, gastritis, peptic ulcer, dysmenorrhoea, sinusitis and mucosal inflammations.

Key constituents of the herb are Beta-Hydrastine, berbeine, canadine as well as other alkaloids.

Due to the potential for toxic and interactive possibilities, Golden Seal should be prescribed only by a qualified, experienced practitioner at accepted therapeutic dosages.

It should be noted that there is considerable adulteration of the herb in commercially available products due to the scarcity and price of genuine Golden Seal and therefore only authenticated, cultivated material should be used.

STRATEGIES

There is no cure for autism, but its effects can be ameliorated.

B. J. Freeman, professor of medical psychology at UCLA has been quoted in saying "whose to say there aren't things in the environment involved in autism. If you look hard enough and know what to look for, you can see evidence of autistic symptoms in the first few months of life in 95% of cases". The key, according to Freeman, is identifying autistic children as soon as possible and acting.

"Very few people talk about a cure, but I have seen plenty of autistic kids treated who are now indistinguishable from normal kids", said the late Dr. Rimland of the Autism Research Institute, an advocate of vitamin therapy.

As all parents of autistic children learn, there is no shortage of autism remedies. Some of these include dietary changes, elimination of gluten and dairy, supplementation, purging the body of heavy metals, toxins and drugs used to combat depression, convulsions and hyperactivity to more controversial therapies like secretin (a hormone involved in digestion) supplementation. (See later comment regarding a co-ordinated, individualised programme).

Equally important in improving autism outcomes is behaviour therapy. Applied Behavioural analysis (ABA) comes in many forms. No single method works for every autistic child. Connecting is the key to behaviour training. While typical children absorb social lessons around them almost automatically, the autistic child does not. For example, a normal preschooler might see his peers line up for class and conclude that he is supposed to as well. The autistic child might not

even notice there are other children nearby. In behaviour training, therapists use visual and verbal cues to teach autistic children what to do and how to behave in different specific circumstances. Sometimes this is done with pictures, food, mimicry or simply repeating a behaviour until the child catches on. The setting for behaviour training can be limited to a child and therapist or parent or can take place in a more communal setting. Aubyn Stahmer, Clinical Research Director of the Children's Toddler School (USA), a preschool that involves and mixes together autistic and developmentally normal children believes "other children are often the best teachers".

Timely intervention is critical; the behavioural therapies are much less effective if begun after autism's main symptoms appear (typically between ages two and four).

The road to recovery in the autistic spectrum of disorders is not an easy one, there is no quick fix or panacea. It is intensive and long, requiring commitment from all concerned parents, families, friends, carers and interdisciplinary practitioners alike. As each child is unique, so will their particular needs be.

BASELINE INVESTIGATION

At many levels in an organised, co-operative and interdisciplinary manner needs to be undertaken.

By definition of the word 'organised' there needs to be a coordinating or 'head' therapist/practitioner otherwise aspects of the Pyramid of Development, Learning and Wellbeing have the potential to be missed and hence progress in restoring functionality of the individual will be unnecessarily impeded.

Trying 'this' then 'that' without a coordinated baseline and intervention plan results in wasted time, effort and money. This is of detriment to both the autistic individual, their families and the integrity of the therapies attempted remember, there is ***NO*** panacea for autism as it is a continuum of disorders manifesting uniquely in the individual concerned. What 'works' with one autistic individual may not necessarily benefit another.

REPAIR

Low Irritant Diet according to metabolic and other findings to support growth and repair:

1. **Address Diet:** Remove processed and packaged foods (additives etc.), gluten, casein, soy, salycilates and oxylates. Fresh, organic is best. Fresh vegetable juices etc.
2. **Supplement:** As per metabolic findings.

RETEST

- The triad of baselines - metabolic, nutritional, neurological.

INTEGRATE

Integrate therapies for sensory integration whilst continuing dietary and biomedical interventions.

- **BODYWORK TECHNIQUES:** To balance postural musculature and autonomic nervous system function to release fascial restrictions and improve circulation and general wellbeing.
- Sound Therapy to stimulate brain and auditory / visual pathways
- Brain Gym and Interactive Metronome for gross motor co-ordination
- Neurofeedback[27, 28, 29, 30]: To promote dendritic outgrowth, enhance brain plasticity, processing, affect and cognition.
- Applied Behavioural Analysis
- Remedial teaching techniques: Speech therapy, Lindamood Bell and Spalding

CONCLUSION

A child's healthy development in all forms, particularly those of social/emotional, communication, and behaviour, should be closely monitored by parents and care givers continually, and by health care practitioners through screenings incorporated into each neonatal visit..... education of all concerned in the care of children as to the early warning signs as well as knowledge of the available interventions and current research into developmental disorders should be a priority of all governments.

Early recognition and appropriate, timely, synergistic interventions are crucial to success in amelioration of developmental disorders and any problem perceived by a parent or teacher as having such warrants attention.

With appropriate interventions, a child can overcome or learn to compensate for a wide range of developmental problems.

Intensive, well designed and timely intervention can improve the prospects and the quality of life for many children who are considered at risk for cognitive, social, or emotional impairment.

Experience in this clinic has shown that with effort, and time, the following multimodal interventions including diet (low allergenic, gluten-free, dairy free) nutritional supplements (Vitamin B, magnesium, essential fatty acids and others as per pathological and metabolic findings of the individual), EEG biofeedback training (synonymous with 'neurofeedback'), ABA training, speech therapy, Samonas Sound Therapy, Sensory Integration methods and aromatherapy are useful in ameliorating many of the symptoms of autism.

FURTHER READING SUGGESTIONS

- Pervasive Developmental Disorders
- Stages of Brain Development
- Sensory-Motor Integration and Learning
- QEEG and Neurofeedback - diagnostic and training modalities for the enhancement of CNS functioning in ADHD and other disorders
- Quantitative Electroencephalography - (QEEG)
- Neurofeedback - EEG Biofeedback - a Drug-Free Strategy for ADHD, Learning Disorders and Other Conditions
- Biofeeback
- Pyramid of Development, Learning and Wellbeing
- The Paleolithic Diet
- Samonas Sound Therapy
- The Interactive Metronome
- Remediation of reading, spelling and comprehension
- A different world, exploring Autism

For more information or to make an appointment please contact us on (02) 9637 9998 during business hours.

AUTISM LINKS

PLEASE NOTE :
Learning Discoveries offers the links below as a convenience to our clients and the users of this website. However, we do not control third party websites and we are not responsible for the websites content.

- **Autism : Intervention Strategies and Synergies Conference and Exposition, Key Note Address, Denver Colorado, Canada**

  http://www.angelfire.com/journal/ldps/DenverAutismConference.htm

  Keynote Address by Rosemary Boon

- **The Australian Advisory Board on Autism Spectrum Disorders**

  http://www.autismspectrum.org.au/a2i1i1l445l487/welcome.htm

  The Australian Advisory Board on Autism Spectrum Disorders is the national peak body representing people who have an autism spectrum disorder, their families, carers and helpers.

- **Autism Spectrum Australia (Aspect)**

  http://www.autismaus.com.au/

  The Australian Advisory Board on Autism Spectrum Disorders is the national peak body representing people who have an autism spectrum disorder, their families, carers and helpers.

- **Children's Neurobiological Solutions, Santa Barbara, California, USA**

  http://www.cnsfoundation.org/site/PageServer

  CNS is a non profit research foundation improving the lives of children disabled by neurological disorders through research focused on brain repair and regeneration.

- **DSM-IV** Published by the American Psychiatric Association

  To view the DSM-IV criteria and revisions online please go to :

  http://en.wikipedia.org/wiki/DSM-IV_Codes

  DSM-IV is a coded reference manual published by the American Psychiatric Association to provide clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study, and treat people with various mental disorders.

- **Education and Services for People with Autism (ESPA)**
  (Formerly known as Autism Research Unit)

  Written and overseen by Dr Paul Shattock (OBE)
  Director of the Autism Research Unit
  University of Sunderland, United Kingdom

  http://www.espa-research.org.uk//

  ESPA Research is committed to continuing and expanding the research undertaken by the Autism Research Unit into various aspects of autism spectrum and related conditions for public benefit. This includes the use of gluten and / or casein-free diets for people with autism along side the discovery of biological entities that may provide insight into any underlying metabolic conditions.

- **Food and Behaviour Research, Dr Alex Richardson**

  Senior Research Fellow, Centre for Evidence-Based Intervention, University of Oxford; Visiting Research Fellow, Dept of Physiology, Anatomy and Genetics, University of Oxford; Founder Director of Food and Behaviour Research

  http://www.fabresearch.org/view_item.aspx?item_id=473

  Food and Behaviour Research (FAB Research) is a charitable organisation dedicated both to advancing scientific research into the links between nutrition and human behaviour and to making the findings from such research available to the widest possible audience.

- **Forum on Alternative and Innovative Therapies**,
  University of Saskatchewan College of Medicine, Canada

  http://healing-arts.org/children/

  Written and overseen by Lewis Mehl-Madrona, M.D., Ph.D.
  Associate Professor of Family Medicine and Psychiatry

  This site is a wealth of information for parents and professionals.

- **Mindd Foundation**

  http://mindd.org/s/archives.php/41-Frontpage.html

  MINDD Foundation promotes an integrative approach to healthcare for the whole family with a focus on biomedicine, nutrition, neuro-development and allied therapies.

  They help practitioners and patients find effective treatments for Metabolic, Immunologic, Neurologic, Digestive, Developmental conditions that often affect the mind.

  There focus is on paediatric disorders such as Autism, ADHD, Asthma, allergies, chronic illness, learning and language delay, and digestive and behavioural disorders. Research is showing that these children are coming from families with a history of brain-immuno-gut disorders such as allergies, digestive disorders, anxiety and depression.

- **The Autism Network for Dietary Intervention (ANDI)**

  http://www.autismndi.com/

  Provides help and support for families using a Gluten Free and Caesin Free diet in the treatment of autism and related developmental disabilities.

- **The Autism Research Institute (ARI)**

  http://www.autism.com/ari/

  Autism Treatment Evaluation Checklist (ATEC)
  http://www.autism.com/ari/atec/

  Mercury Detoxification
  http://www.autism.com/triggers/vaccine/mercurydetox.htm

  The Autism Research Institute (ARI) is the hub of a worldwide network of parents and professionals concerned with autism. The founder and director of ARI is Bernard Rimland, Ph.D., an internationally recognized authority on autism and the father of a high-functioning autistic son. ARI is a non-profit organization which provides its services free of charge, except for nominal fees to cover postage and printing. ARI depends for its support upon charitable contributions from concerned individuals and organisations.

- **The GFCF Diet Autism Diet Resource**

  http://www.gfcfdiet.com/

  Assisting Parents and Individuals with information about The GFCF Diet Dietary Intervention may be that one piece of "the puzzle" which helps a child with ASD toward the road for recovery.

- **The Interdisciplinary Council on Developmental and Learning Disorders**

  http://www.icdl.com/

  The Interdisciplinary Council on Developmental and Learning Disorders - Chaired by Stanley Greenspan M.D., the ICDL is a non profit organisation of professionals from all disciplines working with children with developmental and learning disorders, collaborating and sharing knowledge. Its aim is to improve the identification, prevention and treatment of developmental and learning disorders. It's a wealth of information for professionals and parents.

- **The Rimland Center for Integrative Medicine**
  (Previously known as Advocates for Children Paediatrics Ltd)

  Dr Elizabeth Mumper, M.D., FAAP
  Associate Professor of Medicine, Paediatrics
  Edward Via Virginia School of Osteopathic Medicine

  http://www.rimlandcenter.com//

  Offering expert paediatric consultation with a focus on behavioural problems, learning difficulties, autistic spectrum disorders, and chronic disease. Our practice is unique in its use of state of the art research, patient education, and collaboration with other physicians, community resources, and families

LINKS

- **Autism Help**

  http://www.autismhelp.info/main.htm

  A web resource with text and audio visual introductions to autism spectrum disorders, interventions and treatments.

- **Ideas Inc.**

  http://www.ideas.org.au/

  A comprehensive listing of events as well as information on disabilities and the annual IDEAS Expo

- **Integrated Education and Communication (IEC)**

  http://www.abaservicesaustralia.com.au/

  Integrated Education and Communication (IEC) offer specialized educational and supervisory support services for children who have autism and other related developmental disorders.

  The intervention approach adopted by IEC utilizes the core principles of Applied Behaviour Analysis (ABA), a systematic approach to analysing and changing behaviour.

  IEC offer a complete developmental curriculum targeting areas such as social, communication, academic and independent living skills. Our goal is to provide children with the skills necessary to utilise the educational and social opportunities available in their family and community, with less professional assistance.

- **RDI Connect (formerly known as Learn & Grow : Understanding RDI with Connections Center)**

  http://www.rdiconnect.com/

  RDIconnect provides training for the Relationship Development Intervention treatment program in the USA and Australia.

- **Dr Tony Attwood's Website**

  http://www.tonyattwood.com.au/

  This website is a guide for parents, professionals and people with Asperger's Syndrome and their partners.

  And on this site you will find issues related to Asperger's Syndrome, resources, resource papers Tony has authored, related topics and Tony's presentation schedule.

- **The Center for Autism and Related Disorders, Inc. (CARD)**

  http://www.centerforautism.com/default.asp

  The Center for Autism and Related Disorders, Inc. (CARD) diligently maintains a reputation as one of the world's largest and most experienced organizations effectively treating children with autism, Asperger's Syndrome, PDD-NOS, and related disorders. Following the principles of Applied Behavior Analysis (ABA), we develop individualised treatment plans for your child. We are proud to provide autism services around the globe.

- **Pyramid Educational Consultants of Australia Pty Ltd**

  http://www.pecsaustralia.com/

  Pyramid Educational Consultants of Australia offers training, consultation and products that focus on teaching functional communication and designing effective educational environments. We present a unique blend of broad-spectrum applied behaviour analysis and the development of functional communication skills, emphasising the individual needs of each person. We are also the premier source of training for the Picture Exchange Communication System (PECSTM).

- **The American Academy of Special Education Professionals (AASEP)**

  Journal Article:
  Teaching children with Autistic Spectrum Disorder (ASD) : A Preschool Teacher Survey To Determine Best Practice Approach

  http://aasep.org/aasep-publications/journal-of-the-american-academy-of-special-education-professionals-jaasep/jaasep-summer-2006/teaching-children-with-autistic-spectrum-disorder-a-preschool-teacher-survey-to-determine-best-practice-approach/index.html

- **The Australian Psychological Society (APS)**

  http://www.psychology.org.au/events/

  The Australian Psychological Society maintains a calendar of events for Professional Development (PD) activities and other events organised by the APS, its members and Units, and other organisations with an interest in psychology and psychological issues.

- **Sensory Tools, Genevieve Jereb**

  http://shopau.sensorytools.net/

  Is a Paediatric Occupational Therapist who specializes in sensory integration treatment for children with sensory integration dysfunction, ADD/ADHD, and Autism Spectrum disorders. She offers workshops on ways to support attention, learning and regulation through rhythm and song.

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