A Rational Approach to Treating Autism
Paul Shattock

Does anyone know a gastro-enterologist, anywhere in the Southern Hemisphere who will investigate GI problems in people with Autism Spectrum Disorders?

Four Pillars For Effective Support

1. Enhancement of Respect and Dignity
2. Biology, underlying forces
3. Care: Protection and Encouragement
4. Education

The pillars are of no use in isolation. Remove any of the pillars and the edifice collapses.

Must consider all these elements

For example:-

- The child who lies over the chair all day.
- The child who eats the bark from trees.
- The child who loves salty things, the child who detests or fears the colour orange.


TREATMENTS
a) Hydrotherapy (water plus mineral salts)?
b) Various “bromide salts” (anticonvulsant and sedative)
c) Herbal remedies?
d) Treatment of bowel symptoms (Senna; Calomel, Cod Liver Oil)

TREATED VERY MUCH AS AN ORGANIC DISORDER – NOT PSYCHOGENIC

Interpretation of data is controlled by theories currently in existence and use.

Unfair to criticise for misinterpretation.

Criticism is appropriate where facts are changed or hidden to fit theories.

Requirement for “Safety First” approach.

No definitive answers

Desperate Parents (Langdon Down)

Plenty of charlatans out there!
Dr Asbjorn Følling - 1934

Work was not accepted for publication for years. It did no fit with the theories of the time. Must be untrue.

Guthrie Heel Test 1961-69

Introduction took years

Actions have not taken place in a vacuum. Theories, treatments and service delivery have been controlled by the scientific, cultural and economic climate of the time.

a) Observation and pragmatism basis
b) Psychoanalytical – blame parents
c) Medico-Genetic Model
d) Biological, Social and Pragmatic

“\textit{A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it.}”

Max Planck - 1902
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### ONE in 86 CHILDREN

is equivalent to

### ONE in 50 BOYS

Aged 9-10 will include all spectrum (NB This is NOT ADHD, Dyslexia and other NeuroDiverse conditions)

<table>
<thead>
<tr>
<th>9-10 year old children in N.E. London Total Prevalence of PDD</th>
<th>116.1 in 10,000 equivalent to 1:86 children</th>
</tr>
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</table>

Estimates of 4:10,000 now 116:10,000. Previously missed 97%?

Suggest ratio of boys:girls now 8:1

### Male – Female Ratios For ASDs

- Usually accepted Figure 3-4 to 1
- Recent Figures from UK 7-8 to 1
- Data from Iran (In Press JADD) 1 to 1
- Lack of male births in Northern Canada
- Left handedness tripled in UK in 20 yrs

### Are there any diseases which are either totally genetic or totally environmental in origin?

<table>
<thead>
<tr>
<th>Disease Threshold</th>
<th>Environment</th>
<th>Genes</th>
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<tr>
<td>Dark Skin</td>
<td>Light Skin</td>
<td>Sunlight and Melanoma</td>
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Are children with “ASDs” the same all over the world?

If the environmental factors are different, will people with autism be the same as they used to be?

Are more children diagnosed now? Have “borders” been extended?

Has earlier and more effective intervention had an effect?

Are children with “ASDs” the same all over the world?

Bahrain and later onset of Symptoms

10 of 22 children (45%) showed no signs until 20 months – mainly 24 months (probably an underestimate)

Koran requires breast feeding to continue until age of 2. Presentational differences: sociability?
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ONE SIMPLIFIED ROUTE MAP TO AUTISM
Numerous Genes act separately or in combination
Sulphation Methylation Amino-Acids e.g. Lactase
Many Environmental Triggers varying with Location & History
Infection History Vaccinations Pesticides Dietary Status
Metals (Heavy and essential) Gut Dysbioses ??????????
Opioid Peptides Carbohydrates Other Metabolites
Common Final Pathways
Neurotransmitters Physical Structures
Variety of Symptoms of Autism

Genetic Fragility

Environmental Stressors - Cumulative.

Some dietary products that are more common in a maritime diet.
Elements – Iodine, Selenium, Zinc
Fish Oils containing readily available omega three fatty acids
Vitamins from fish – Vitamin A, D and some B group (B12)
Human EVOLVED near the sea. Our nutritional requirements assume that we are still there.

What environmental factors may be involved with different individuals?
Diet – gluten, casein, corn, soya, GM products, MSG, Aspartame, eggs, beef, avocado, allergenic foods.
Natal Issues – ultrasonics, cord cutting, Rhogam, antibiotics, drugs, hypoxia/anoxia, infections vitamin K, folate, alcohol, deficiencies of essential vitamins, minerals. fatty acids.
Exposures (especially during term) – pesticides, PCBs, dioxins, bisphenols, mobile phones, heavy metals, immune and endocrine modulators, infections, vaccines.
Physical Factors – Head trauma, gut or CNS ops,
Mental Stress – exacerbation of all symptoms

What is Beta-Endorphin?
A peptide with morphine-like activity which occurs naturally in certain brain areas (endogenous morphine = endorphin)

Some reported effects of beta-endorphin
2. Altered EEG patterns - involvement with epilepsy
3. Modification of sleep patterns

Intestinal Dysbioses
John Hunter (Cambridge)
Sophie Rosseneu (Royal Free, London)
Glen Gibson (Reading)
Use of antibiotics during pregnancy and early infancy;
Caesarian births
Problems with establishment of appropriate bacteria.

Integrative Solutions - Melbourne, 2009
www.minddd.org
Some reported effects of beta-endorphin (cont)

4. Effects on Memory and Learning - Reward leading to reinforcement and motivation
5. Decrease in Sociability
6. Involvement in Stereotypy/hyperactivity
7. Modification of Intake of Food and Drink
8. Constipation - “Abnormal” Poo
9. Regulation of Body Temperature

There are many other effects. This list is by no means exhaustive.

Hypotheses

1. Peptides interfere with neurotransmission in all the major systems of the C.N.S.
2. These peptides are derived from the incomplete digestion of food, principally gluten and casein, in the Gastro-Intestinal Tract.
3. These peptides cross into the bloodstream and can enter the C.N.S. to exert their effects.

What are these biologically active compounds?

PEPTIDES

PROTEINS are made up of very long chains of AMINO-ACIDS.

During digestion, proteins are broken down into short chains called PEPTIDES. Typically, peptides contain 2-8 amino-acids, but may be much larger (e.g. beta-endorphin).

Leu-ENKEPHALIN (A naturally occurring neuropeptide)

Tyr-Gly-Gly-Phe-Leu

Beta-CASOMORPHIN

Human Tyr-Pro-Phe-Val-Glu-Pro-Ile
Bovine Tyr-Pro-Phe-Pro-Gly-Pro-Ile

These Peptides will affect transmission in the C.N.S. and may therefore affect:

- Perception (Vision, Hearing, Taste, etc)
- Cognition
- Behaviours (e.g. Stereotypies)
- Mood
- Emotions
- C.N.S. development (pruning of CNS)
- (Immune System)
- (Gastro Intestinal Tract)

Standard urine sample for person with ASD

Beta casomorphin 1-7

Problems with casein
Urine profile: Male (born 1986), ASD
Behavioural regression following MMR vaccine

Sulphation Problems in ASDs?


ONE HOUR after PARACETAMOL
determine ratio of Paracetamol sulphate
Paracetamol glucuronide

**MEAN RATIO OF SULPHATE / GLUCURONIDE**

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**PLASMA SULPHATE LEVELS**

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WARING, R.H., NGONG, J., KLOVRZA, L.
University of Birmingham, School of Biochemistry, UK

MEAN RATIO OF SULPHATE / GLUCURONIDE

**AUTISM**: 0.87 +/- 0.67 (n = 46)
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**PLASMA SULPHATE LEVELS**

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**Alberti A., Pirone P., Elia M., Waring R., Romano C.**

“A sulphation deficit in autistic children: a pilot study.”

**Biological Psychiatry 8** 420-424 (1999)

**Sulphur Metabolism in Autism**

Waring & Klovrza (2000)
Journal of Nutritional and Environmental Medicine 10, pp25-32

**Results:**

<table>
<thead>
<tr>
<th></th>
<th>Autism (n=232)</th>
<th>Controls (n=68)</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>7.6 ± 2.4</td>
<td>8.5 ± 3.7</td>
</tr>
<tr>
<td>Sulphite</td>
<td>106.9 ± 162.9*</td>
<td>2.1 ± 6.3</td>
</tr>
<tr>
<td>Sulphate</td>
<td>68190.0 ± 6712.3*</td>
<td>3030.8 ± 1461.0</td>
</tr>
<tr>
<td>Protein</td>
<td>103.2 ± 89.9*</td>
<td>64.5 ± 27.5</td>
</tr>
<tr>
<td>Thiosulphate</td>
<td>130.8 ± 148.1*</td>
<td>18.6 ± 25.0</td>
</tr>
<tr>
<td>Thiocyanate</td>
<td>6.4 ± 16.9*</td>
<td>44.0 ± 101.0</td>
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Anion excretion in nmol/ml. Mean±SD* p<0.001 (Wilcoxon rank sum test)

**Effects of lack of sulphating ability:-**

1. Neurotransmitters not removed from system;
3. Mucus lining of GI tract becomes patchy - increases permeability of intestines;
4. GAGs of GI wall less sulphated - increases permeability of intestinal wall;
5. Loss of activity of certain hormones (CCK and Gastrin?) and resulting malabsorptions;
6. Easing of access for Yeasts.
IAG also appeared to be elevated in urine samples from other groups.

1) Subjects with problems related to Autism; AD(H)D; Dyslexia; Dyspraxia; Chronic Fatigue Syndromes.

2) Subjects with Gulf War Syndrome.

3) Subjects with Sheep Dippers' Syndrome (Fruit Pickers' Syndrome (US))

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**Anderson RJ, Bendell DJ, Garnett I, Groundwater PW, Lough WJ, Mills MI, Savery D, Shattock PEG. “Identification of Indoly-3-Acryloyl Glycine in the urine of people with autism.”**


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**Alcorn A., Berney T., Bretherton K., Mills M., Savery D., Shattock P.**

“Urinary Compounds in Autism”

*Journal of Intellectual Disability Research 48* (Part 3) 274-278 (March 2004)
CAVEAT........

“Is the presence of urinary indolyl-3-acryloyl glycine associated with autism spectrum disorders?”
No! (but.............)

Are these observations of unusual levels of compound relevant?
.....or are they mere flotsam thrown upon the metabolic beach?
Do they result from the body’s attempts to correct errors?
....and could we, by interfering with these processes make it worse?

VALUE OF METABOLIC TESTING
1) Many parents have spent thousands of Euros on meaningless testing. (Payment for Research Projects)
2) Testing must have clinical relevance – influence treatment modality.
3) Testing is pointless without professional support and advice.
4) Use of “Treatment Protocols” until full understanding. “Pragmatism without understanding is frustrating.” Brostoff 2007

Some Oxidative Stressors
Pesticides esp. OPs Excess Copper or Iron ions
Infections and Immune Responses Respiration
Exclusion Diets Mercury
Some Drugs (valproate)

REDOX BALANCE
(Oxidative v Reductive Environment)
Paraoxonase Enzymes Glutathione Peroxidase
Ceruloplasmin and Transferrin (requires selenium)
Vitamin C and Vitamin E

Overlapping of Function
Systems are designed for particular function but have other abilities.
If one system is suboptimal it is not fatal as others take over the function.
Pressure on any part of system through too much stressor or too little activity puts stress on the whole redox system.
Benefits may not be directly related to known effects.

Spectrum of Treatment Modalities
Psychotherapy and Counselling
Exclusion Diets
Behavioural Approaches Alteration of “Environment”
Traditional Teaching Detox. Support
Sensory & Cognitive Programmes Biomedical Approaches
Symptomatic Medication
The Sunderland Protocol

A logical system for the implementation of biomedical interventions for people with autism and related disorders.

The protocol is divided into three sections and is based loosely upon the “Northern Ireland Peace Process”

1. The Ceasefire - removal of guns and bullets;
2. The Preliminary Agreement - and analysis of underlying problems;
3. Active Reconstruction - permanent resolution.

Each therapy must be seen as a part of an overall treatment programme.

These biomedical interventions are not alternatives to an educational programme - they are complementary.

Each intervention must be seen as a time limited experiment for that person. Only if the benefits outweigh the problems - continue. If not - stop it.

Be prepared to revisit failed interventions..

Before you start......................

1. Read and understand;
2. Obtain professional support;
3. Consider known conditions - Coeliac Disease and amino-acids;
4. Take a good, balanced,(GF/CF) vitamin and mineral supplement.

THE SUNDERLAND PROTOCOL

(Shattock & Whiteley, 2000)

“CEASEFIRE” - Remove source of bullets
1. CASEIN - 3 weeks
2. GLUTEN - 3 months

PRELIMINARY AGREEMENT
3. OTHER FOODS - Food diary (Corn; Soya; Tomatoes; Avocado; Beef et al)
4. TESTING - Vitamins, Minerals, Amino Acids, Allergies (IgG, IgE)
   Supplement as appropriate: Zn, Ca, Mg, Mo, A, C, B, B6
5. PARASITIC ORGANISMS - Yeasts, Others

ACTIVE RECONSTRUCTION
6. SULPHATION ISSUES - Epsom Salts (Internal/External), MSM
7. ENZYME ACTIVITY - Betaine Hydrochloride
8. FATTY ACIDS - Evening Primrose Oil, Fish Oils, Cod Liver Oil (Vit. A), Flax Seed
9. L-GLUTAMINE - Correct Imbalance, Intestinal Nutrient
10. ENZYME SUPPLEMENTATION - Bromelain, Saran-Aid, EnzymAid.
11. 5-HYDROXYTRYPTOPHAN (5-HTP) 14. MEGADOSE B6 & Mg
12. PIGMENT-FREE 15. DIMETHYLGLYCINE (DMG)
13. SALICYLATE-FREE 16. SPECIFIC CARBOHYDRATE DIET

LIST OF DRUGS DEMONSTRATED AS BEING EFFECTIVE AND SAFE IN THE TREATMENT OF AUTISM

May 2005. FDA fails to approve Risperidone for use in Autism.

Approved in September 2006.

Problems with “Proof”

Gold-Standard: Randomised Placebo Controlled Cross-over Trials:-

1. Difficult to fund if not patentable.
2. Difficult to design and obtain ethical approval. Permanent change?
3. Miss effects on sub-groups (eg Secretin and omega 3s).
4. In the interests of large companies. Hide unfavourable effects (see 3)
THE CEASEFIRE

1. Remove Casein Derivatives;
   three weeks and assess situation.

Milk from Cows is wonderful food for Baby Cows

.....or for genetically modified humans – those with thick leather skins and horns....... 

Food ain’t what it used to be.

Milk

1) Different Breeds (species);
2) Pasteurized & homogenized;
3) Days old (at best);
4) Cows fed on different food – different fatty acid component;
5) US only (packed with hormones and antibiotics).

“THE CEASEFIRE”

1. Remove Casein Derivatives;
   three weeks and assess situation.
2. Remove Gluten and derivatives;
   three months (at least) - assess.

Separate elements to minimise side effects;
Preliminary stage - remove obvious “bullets”.

Some transient negative effects following the removal of gluten and/or casein from the diet of people with autism.
These effects are variable in extent but experience suggests that they may be more apparent in younger and smaller children.

- Anxiety
- Clinginess
- Crying and general whinging
- Staring into space
- Marked decrease in movement / dizziness
- Increased frequency in urination / defaecation
- Flu-type symptoms

Diet did have a positive effect on behaviour and cognitive functioning of most participants although there was variability in each child’s response to it.

Gluten free group: Primary changes in behaviour

- Increased attention and concentration
- Increased awareness of self and surroundings
- More calm and settled
- Decreases in hetero and/or auto aggression episodes
- Improved sleeping patterns
EPILEPSY
a Warning!

PRELIMINARY AGREEMENT
3. Keep a food diary - Idiosyncratic effects
   (Corn; soya; eggs; beef; tomato; avocado.)
4. Testing - vitamins and minerals;
   - allergies (IgE; IgG; others?)
   supplement or remove as appropriate.
5. Parasitic organisms;
   - consider yeasts; protozoa; worms.

ACTIVE RECONSTRUCTION PROCESS
6. Sulphation Issues - Epsom salts; MSM.
7. Enzyme activity - Betaine Hydrochloride.
8. Fatty Acids - a) evening primrose, b) fish oils; c) cod liver oil (Vit A); d) flax oil.
9. L-Glutamine;
   correct imbalance; nourish intestines.
10. Enzyme supplementation - bromelain;
   SerenAid; EnzymeAid; PeptizAide

ACTIVE RECONSTRUCTION PROCESS
11. 5-Hydroxy Tryptophan (5HTP);
    - to bridge the missing stage.
12. Pigment-free diet (sulphation issues).
13. Salicylate-free diet;
    - prostaglandin inhibition.
15. DiMethyl Glycine (DMG).
16. Specific Carbohydrate Diet.

Spectrum of Treatment Modalities
Psychotherapy and Counselling  Exclusion Diets
Behavior Approaches  Regulation of Drugs
Traditional Teaching  Biomedical Approaches  Detox. Support
Sensory & Cognitive Programmes  Symptomatic Medication

Some Potentially Useful Medications
which with “regulatory” effects
1. Piogliazone (Actos) (30-60mg/day)
   Currently used for treatment of diabetes
3. Spironolactone Once extensively used to control high blood pressure.
4. Very low dose Naltrexone (LDN)
Do we affect the rate of breakdown of drugs with biomedical interventions?

- By encouraging sulphation with Epsom Salts and MSM?
- By encouraging methylation with B12, Betaine, Folic Acid?
- By introduction of other foods or drugs using same breakdown paths.
- Available levels may change with sweating.

The Rising Sun Coal Mine - Newcastle
Mining since 1650. Extremely polluted with heavy metals and other chemicals.

A school was recently opened on this site

Rising Sun School for Autistic Children