Dr. Peter Osborne

Presents...
The Gluten Sensitivity Spectrum:

- Musculoskeletal Damage
- Digestive problems
- Nerve Damage
- Skin Disease
- Autoimmune Disease
- Hormone Disruption
You must first arm yourself with knowledge!

The most important thing to remember is this:

Celiac disease and gluten intolerance are not the same thing.
Gluten Sensitivity ≠ Celiac Disease

Science Finally Confirms Gluten Sensitivity

A new double blind, randomized, placebo controlled study published in the American Journal of Gastroenterology confirms the presence of gluten sensitivity in the absence of celiac disease. This is the first study of its kind confirming the existence of gluten intolerance in the absence of celiac disease.

Source:

Gluten Sensitivity has traditionally been used synonymously with Celiac disease because that has been the focus of research.

These terms have been created in the medical literature to separate Celiac Disease from Gluten Sensitivity:

- Non-Celiac Gluten Sensitivity – Dr. Marsh
- Gluten Syndrome – Rodney Ford, M.D.

The Gluten Syndrome
Is wheat causing you harm?
Unpublished data from Dr. Kenneth Fine, laboratory director at Enterolab, speculates that one in three have some degree of gluten intolerance!
Classic Symptoms

Clinical symptoms of Celiac disease taught in graduate school are extreme weight loss, diarrhea, stomach pain, bloating, and vomiting.

In actuality symptoms can be and usually are systemic and we now know that different people respond in different ways.
On Celiac vs. Gluten Sensitivity

“Recent studies are showing the gluten sensitivity may be much more common than previously thought. It may, in fact, be a separate disease entity that involves different organs and different mechanisms than celiac disease. While there is no doubt that the condition exists, the lack of definite criteria for a diagnosis has resulted in a skeptical attitude on the part of many doctors.” He goes on to say: “The acceptance of gluten sensitivity as a valid condition has evolved.”

– Dr. Peter Green - Director of The Celiac Disease Center at Columbia University
On Celiac vs. Gluten Sensitivity

60-70% of those who think they have celiac disease and seek help from his research center are actually gluten sensitive – they do not have celiac disease.

Communication from Dr. Alessio Fasano – University of Maryland Celiac Research Center

Courtesy of Dr. Vikki Petersen (Author of the Gluten Effect)
Why is the focus primarily on celiac disease?
Gluten Sensitivity
- Is not a disease
- It is a state of genetics
- If ignored, can trigger disease
- One of the diseases it can trigger is...

Celiac Disease
- Is a disease
- Triggered by genetics and environment
Gluten Sensitivity/Intolerance is not a disease, but it causes disease.

- Celiac Disease
- Rheumatoid Arthritis
- Cancer (Lymphoma)
- Psychological Disorders
- Thyroid Disease
- Asthma
- Bone Loss Osteoporosis
- Fibromyalgia & CFS
“Gluten sensitivity is a systemic autoimmune disease with diverse manifestations. This disorder is characterised by abnormal immunological responsiveness to ingested gluten in genetically susceptible individuals. Coeliac disease, or gluten-sensitive enteropathy, is only one aspect of a range of possible manifestations of gluten sensitivity. Although neurological manifestations in patients with established coeliac disease have been reported since 1966, it was not until 30 years later that, in some individuals, gluten sensitivity was shown to manifest solely with neurological dysfunction.”

All Patients with Autoimmune Disease should be screened for Gluten Sensitivity…

Diagram Modified from: Nature Immunology 2, 759 - 761 (2001)
Silent Celiac Disease is Gluten Sensitivity

**Table 1.** Manifestations of silent celiac disease (predominantly extra-intestinal).

- Dermatitis herpetiformis
- Anemia
- **Autoimmune disorders**
- Osteoporosis
- Neurological disorders
  - Epilepsy with cerebral calcification
  - Neuropathy
  - Cerebellar ataxia
  - Chorea
- Infertility/subfertility
- Non-alcoholic fatty liver disease
- Unexplained chronic hypertransaminasemia

Symptoms and signs in individuals with serology positive for celiac disease but normal mucosa
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Abstract
Background: Antibody serology is an important tool in the investigation of celiac disease (CD), but does not always correlate with mucosal appearance in the small intestine. Patients with positive CD serology but normal mucosa (Marsh 0) are at increased risk of future CD. In this study we describe a model for identifying and characterizing individuals with normal mucosa but positive CD serology. Such individuals are sometimes referred to as having latent CD.

Methods: The records of ten Swedish pathology departments were used to identify individuals with biopsies indicating normal duodenal/jejunal mucosa. Using the national personal identification number, these data were linked with CD serology data (antigliadin, antiendomysial and tissue transglutaminase antibodies); and we thereby identified 3,736 individuals with normal mucosa but positive CD serology. Two independent reviewers then manually reviewed their biopsy reports to estimate comorbidity. We also randomly selected 112 individuals for validation through patient chart review.

Results: The majority of the 3,736 individuals were females (62%). Children (0–15 years) made up 21.4%. The median number of biopsy specimen was 3. Our review of biopsy reports found that other gastrointestinal comorbidity was rare (inflammatory bowel disease: 0.4%; helicobacter pylori infection: 0.2%). Some 22% individuals selected for patient chart review had a relative with CD. The most common symptoms among these individuals were diarrhea (46%) and abdominal pain (45%), while 26% had anemia. Although 27% of the individuals selected for validation had been informed about gluten-free diet, only 13% were adhering to a gluten-free diet at the end of follow-up.

Conclusion: Individuals with positive CD serology but normal mucosa often have CD-like symptoms and a family history of CD.
Gastroesophageal reflux symptoms in patients with celiac disease and the effects of a gluten-free diet.
We have, however, shown that neurological dysfunction can not only precede coeliac disease but can also be its only manifestation... The typical clinical expression of a patient with gluten sensitivity where the sole manifestation is neurological is cerebellar ataxia, often with a peripheral neuropathy. Most of these patients will have histologically normal mucosa on biopsy and few or no gastrointestinal symptoms. Both the ataxia and the neuropathy may be reversible with adherence to a gluten free diet.
Gluten-Sensitive Enteropathy (Celiac Disease): More Common Than You Think

TABLE 2
Symptoms of Celiac Disease and Possible Causes

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue, malaise</td>
<td>Anemia, general immune system activation</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Nutrient malabsorption</td>
</tr>
<tr>
<td>Diarrhea, abdominal pain</td>
<td>Accelerated gastrointestinal tract</td>
</tr>
<tr>
<td></td>
<td>transit time, steatorrhea, malabsorption</td>
</tr>
<tr>
<td>Anemia</td>
<td>Most commonly, iron deficiency; less commonly, vitamin B₁₂ and/or folate deficiency</td>
</tr>
<tr>
<td>Bone pain</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>Aphthous oral ulcers, glossitis, stomatitis</td>
<td>Vitamin deficiency, &quot;oral&quot; celiac disease</td>
</tr>
<tr>
<td>Infertility</td>
<td>Postulated cause: iron, folate, and/or zinc deficiency</td>
</tr>
<tr>
<td>Male impotence, decreased libido</td>
<td>Peripheral insensitivity to circulating testosterone</td>
</tr>
<tr>
<td>Alopecia areata</td>
<td>Immunologic attack on hair follicles</td>
</tr>
<tr>
<td>Dental enamel defects</td>
<td>Demineralization during tooth bud development in children</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Delayed absorption of glucose</td>
</tr>
<tr>
<td>Gas, flatus, barborygmus</td>
<td>Secondary digestion of sugars by intestinal flora</td>
</tr>
<tr>
<td>Seizures, gluten ataxia, central nervous system symptoms</td>
<td>Increased affinity of celiac antibodies for brain vasculature</td>
</tr>
</tbody>
</table>

A patient information handout on celiac disease, written by the author of this article, is provided on page 2269.

Commonly called, celiac disease, is an illness that is precipitated by the ingestion of gluten in genetically susceptible persons. The mucosa, resolution of the malabsorption effects of celiac disease. Recent studies of celiac disease is approximately one in 100 people commonly manifests as "silent" serologic tests for antibodies against certain foods most patients with the disease who are at increased genetic risk for development of celiac disease or personal history of chronic diarrhea, unexplained anemia, arthritis, and malabsorption, such as osteoporosis (2269-70). Copyright 2002 American Medical Association.

The disease was first described late in the 19th century, with the first report in 1928. As late as the mid-20th century when improve dramatically from their diet. With jejunal biopsy technique was identified as the gold standard of villous flattening, crypt hyperplasia, and increased intraepithelial lymphocytes (Figure 1) were shown to normalize after the institution of a gluten-free diet.

In the mid-1960s, an enteropathy strikingly similar to celiac disease was identified in patients with dermatitis herpetiformis. Subsequently, this skin disorder was shown to be a manifestation of gluten-sensitive enteropathy. In the mid-1960s, adult celiac disease was also noted to be associated with numerous neurological symptoms, including peripheral neuropathy, anemia, and autoimmune diseases.
Celiac Disease without Villous Atrophy in Children: A Prospective Study.

“The study provided evidence that children who are EmA positive have a celiac-type disorder and benefit from early treatment despite normal mucosal structure, indicating that the diagnostic criteria for celiac disease should be re-evaluated.”

A new report in the *New England Journal of Medicine* identifies antibodies against osteoprotegerin (a protein that prevents bone breakdown) in several patients with celiac disease. This protein is responsible for helping maintain bone density. When it is attacked by the body’s immune system, bone loss becomes accelerated contributing to osteoporosis.

“a wide spectrum of liver injuries in children and adults may be related to CD and in particular: (1) a mild parenchymal damage characterised by absence of any clinical sign or symptom suggesting a chronic liver disease and by non-specific histological changes reversible on a gluten-free diet; (2) a chronic inflammatory liver injury of autoimmune mechanism, including autoimmune hepatitis, primary sclerosing cholangitis and primary biliary cirrhosis, that may lead to fibrosis and cirrhosis, generally unaffected by gluten withdrawal and necessitating an immunosuppressive treatment; (3) a severe liver failure potentially treatable by a gluten-free diet. Such different types of liver injuries may represent a spectrum of a same disorder where individual factors, such as genetic predisposition, precocity and duration of exposure to gluten may influence the reversibility of liver damage.”
What?
Keep in mind…

Gluten intolerance/sensitivity is not the sole cause of the following diseases. In cases where a person does not have a known cause for their diagnosis, gluten sensitivity should be ruled in or out. Therefore; those with the following conditions should be genetically screened…
• Angina Pectoris (chest pain/pressure)
• Anorexia
• Immunoglobulinopathies
• Antiphospholipid syndrome
• Anxiety
• Apathy
• Aphthous ulcers and canker sores
• Aortic Vasculitis
• Arthritis
  • Juvenile rheumatoid
  • Enteropathic
  • Psoriatic
  • rheumatoid
• Abdominal pain and distention
• Spontaneous abortion
• Addison’s Disease
• ADHD
• Alopecia (hair loss)
• Anemia
  • Iron deficiency
  • Folate deficiency
  • B-12 deficiency
  • B-6 deficiency
  • Vitamin C deficiency
  • Vitamin E deficiency
  • Copper deficiency
- Ataxia
- Atherosclerosis
- Autism and other learning disorders
- Cholangitis (gall bladder)
- Dermatitis Herpetiformis
- Autoimmune hepatitis
- Polyglandular syndrome
- Thyroiditis (hypothyroidism)
- Bitot’s spots
- Blepharitis
- Abnormal blurry vision
• Bone pain
• Bone fractures
• Cachexia
• Bronchiectasis
• Barrett’s Esophagus
• Bronchoalveolitis
• Adenocarcinoma of the intestine
• Small cell esophageal cancer
• Melanoma
• Asthma
• Cardiomegaly
• Cardiomyopathy
• Cataracts
• Cerebral perfusion abnormalities
• Cheilosis
• Chorea
• Coagulation abnormalities
• Crohn’s disease
• Ulcerative colitis
• Chronic constipation
• Coronary artery disease
• Diarrhea
• Lymphoma
• Cutaneous vasculitis
• Cystic fibrosis
• Delayed puberty
• Failure to thrive
• Dementia
• Depression
• Dermatomyositis
• Diabetes Mellitus type I
• Down syndrome
• Dysmenorrhea
• Dysgeusia
• Duodenal erosions
- Edema
- Eczema
- Dysphagia
- Epilepsy
- Spontaneous nose bleeds
- Erythema nodosum
- CFS
- Growth retardation
- Mental retardation
- Secondary food allergy response
- Blood in the stool
- Gastric bloating
- Grave’s disease
- Bleeding gums
- Hair loss
- Heartburn
- H. pylori infection
- Hives
- NAFL
- Malnutrition and nutritional deficiencies
- Infertility
- Hypogonadism
- Hypoglycemia
- Hypospleenism
- Thrombocytopenia
- Impotence
- Osteoporosis
- Insomnia
- IBS
- Keratomalacia
• Lactose intolerance
• Loss of smell
• Non Hodgkin lymphoma
• Early menopause
• Migraine headache
• Multiple sclerosis
• Muscle wasting
• Myopathy
• Obesity
• Osteomalacia
• Osteopenia
• Parathyroid carcinoma
• Pancreatic insufficiency
- Polymyositis
- PMS
- Biliary cirrhosis
- Psoriasis
- Dermatitis
- Sjogren’s syndrome
- Short stature
- Scleroderma
- Steatorrhea
- Spina bifida
- SLE
- Tremors
- Parkinson’s disease
- Glossitis
- Vitiligo
- Vomiting
- Vaginitis
- UTI
Factors affecting mucosal immune system resulting in intestinal barrier dysfunction, autoimmunity and nervous system abnormalities.

Aside from physical stress, gluten has been shown to contribute to all of these mechanisms...

INTESTINAL BARRIER DYSFUNCTION

FOOD ALLERGY & INTOLERANCE

IMMUNE SYSTEM ABNORMALITIES

AUTOIMMUNITY

INFLUENCE ON THE BLOOD-BRAIN BARRIER AND NEUROAUTOIMMUNITY
Diagram 1 – Possible Mechanisms and Consequences of Magnesium Deficiency

- **Diet** (i.e. ↑ refined CHO)
- **Stress** (alcohol, caffeine, anti HTN meds)
- **Diuretics**

↓ Mg ++
(serum and cellular)

↑ blood lipids
↑ Platelet aggregation

- Depression
- Vaso-constriction
- Muscle spasm & Pain
- ↓ Bone Mineralization

- ?SSRI’s?
- Hypertension

- ?Diuretics?
- ?HRT? NSAIDS?
- ?Aspirin?
- ?Statins?

CoQ10

SSRI – Selected Serotonin Reuptake Inhibitors
HRT – Hormone Replacement Therapy
NSAIDS – Non steroidal Anti-Inflammatory Drugs

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The Gluten Sensitivity HYDRA

- Joint pain
- Bloating
- Acne
- Hormone Imbalance
- Fatigue
- Nausea
- Weight Gain

Treating these symptoms with medicine does not resolve the origin of a patient’s problem...
What is Gluten?

- Gluten is a mixture of proteins found in all grains. It is composed of two primary subfractions:
  - Prolamines
  - Glutelins
- The prolamine gliadin is the most studied piece of gluten in the medical literature as it relates to celiac disease.
# The Prolamine Fraction of Proteins in Grains

<table>
<thead>
<tr>
<th>Grain</th>
<th>Prolamine</th>
<th>% Total Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>Gliadin</td>
<td>69</td>
</tr>
<tr>
<td>Rye</td>
<td>Secalinin</td>
<td>30-50</td>
</tr>
<tr>
<td>Oats</td>
<td>Avenin</td>
<td>16</td>
</tr>
<tr>
<td>Barley</td>
<td>Hordein</td>
<td>46-52</td>
</tr>
<tr>
<td>Millet</td>
<td>Panicin</td>
<td>40</td>
</tr>
<tr>
<td>Corn</td>
<td>Zien</td>
<td>55</td>
</tr>
<tr>
<td>Rice</td>
<td>Orzenin</td>
<td>5</td>
</tr>
<tr>
<td>Sorghum</td>
<td>Kafirin</td>
<td>52</td>
</tr>
<tr>
<td>Teff</td>
<td>Penniseiten</td>
<td>11</td>
</tr>
</tbody>
</table>
“Unexpectedly, a sequence from \( \omega \)-gliadin (wheat) and C-hordein (barley) but not \( \alpha \)-gliadin was immunodominant regardless of the grain consumed.”
Prolamine Definition

- Any of a class of simple proteins soluble in alcohol and usually having a high proline and glutamine content, found in the grains of cereal crops such as wheat, rye, barley, corn, and rice.

- Prolamines are further subclassified into:
  - alpha, beta, gamma and omega fractions
  - Alpha and beta gliadins are the most well studied in relation to celiac disease.
Grains are the seeds of grass. The seed has a bran casing, a starchy endosperm which contains 90% of the protein (including gluten), and a small germ nucleus which is the plant embryo, waiting to grow. Any flour made from the starchy endosperm contains prolamines and is potentially toxic to the grain sensitive/intolerant person.

Excerpt from:
"Nutrition Therapy"
by Stephen J. Gislason, MD
What is Gluten Sensitivity?

• The current yet antiquated definition is as follows:
  • Gluten sensitivity is an immune reaction to the protein gluten found in wheat, barley, and rye. The definition sometimes includes oats & sometimes does not. This definition is often times incorrectly used synonymously with celiac disease.
  • Why is it inconsistent?
  • What about those with non celiac symptoms?
  • What about other gluten containing grains?
Definitional Differences

- **Gluten Allergy** is typically considered to be an allergy (immune mediated response).
- **Gluten intolerance** is considered to be an inability to tolerate gluten (immune and non immune mediated).
- **Gluten Sensitivity** is a mesh of the above two terms.
- **Celiac Disease** is an autoimmune disease of the small intestine caused by gluten induced damage.
Allergy = Immune Reaction

Acute

IgE = Antibody

Chemical Inflammation

This is what your allergy doctor measures with a skin prick test

Delayed Hypersensitivity

T-Cell Reaction

IgG, IgA, IgM, (IgD?) Antibodies

Chemical Inflammation

Immune Complexes

Tissue Damage

Disease

What about these?

This is what your GI doctor measures in your blood when testing for celiac disease.
True Allergy Reaction to Gluten (IgE)

Schematic presentation of the pathophysiology of the immediate hypersensitivity reactions (Type 1 allergy) of the intestine.
Common Acute Food Allergy Reactions

- Hives - itching, burning and swelling of the skin
- Eczema – redness and small blistering of skin
- Bronchitis
- Asthma
- Coughing
- Sneezing
- Diarrhea
- Colic
- Vomiting or excessive spitting up
Gluten Intolerance

Inability to Digest Gluten

Gut Dysbiosis

Leaky Gut/Intestinal Permeability

Acquired Allergy

Production of immune system production of antibodies and inflammatory chemicals

Tissue Damage

Disease

Zonulin Production (a protein that dismantles tight junctions)
Gluten Sensitivity/Intolerance

- Celiac Disease
- Rheumatoid Arthritis
- Bone Loss Osteoporosis
- Cancer (Lymphoma)
- Asthma
- Psychological Disorders
- Fibromyalgia & CFS
- Thyroid Disease
Diagnosing Gluten Sensitivity

- **Blood tests**
  - Non specific
  - High tendency towards false negative

- **Biopsy**
  - Only diagnostic for celiac disease
  - Not an accurate representation of the entire intestine or of extra intestinal damage

- **Genetics**
  - Very accurate for identifying potential to react to gluten

- **Stool tests**
  - More accurate than blood but still limited to gliadin

- **Predictive antibody testing**
  - in development
  - Used to monitor more than diagnose
Old School vs. New School

Old School:
1. Celiac disease is the only manifestation of gluten sensitivity
2. Intestinal biopsy is the gold standard for diagnosis of celiac disease
3. Antibody blood tests are used for gliadin
4. Extraintestinal manifestations of celiac disease are rare

New School:
1. Celiac is a rare manifestation of gluten sensitivity
2. HLA-DQ testing with clinical symptoms is the gold standard for gluten sensitivity recognition
3. Extraintestinal manifestations of gluten intolerance are a major cause of missed diagnosis in developed nations worldwide.
Genetic Influence on the Gut Response

Depiction of the intestinal mucosa with emphasis on the factors involved in the development of celiac disease in individuals with HLA-DQ2/DQ8 positive.
All TCC were found to secrete interferon (IFN) γ, often at high concentrations (>2000 UI/ml); some secreted in addition interleukin (IL) 4, IL 5, IL 6, IL 10, tumour necrosis factor (TNF), and transforming growth factor (TGF) β. The last TCC thus displayed a Th0-like cytokine pattern. However, other TCC produced IFN γ and TNF but no IL 4, or IL 5, compatible with a Th1-like pattern.
The Gluten Positive Genes

- HLA-DQα1 Gene
  - 0505 (DQ2)*
  - 0501 (DQ2)*
  - 0301 (DQ8)*

- HLA-DQβ1 Gene
  - 0201 (DQ2)*
  - 0202 (DQ2)*
  - 0302 (DQ8)*
  - 03xx (DQ3)
  - 01xx (DQ1)
  - 05xx (DQ1)
  - 06xx (DQ1)
Gluten sensitivity related to HLA alleles other than HLA-DQ2 or DQ8


High prevalence of celiac sprue-like HLA-DQ genes and enteropathy in patients with the microscopic colitis syndrome.


OBJECTIVE: Celiac sprue is associated with specific HLA-DQ genes (mainly DQ2). Because there are epidemiological and histopathological similarities between celiac sprue and microscopic colitis, we hypothesized that these syndrome may share an HLA genetic predisposition and pathogenesis. METHODS: The HLA-DQ genes of 25 patients with celiac sprue, 53 patients with the microscopic colitis syndrome, and 429 normal controls were typed and compared. Serum was analyzed for antigliadin and antiendomysial antibodies. Small intestinal biopsies were analyzed for signs of histopathology. RESULTS: HLA-DQ2 or DQ1,3 (the latter as DQ1,7,DQ1,8, or DQ1,9) were seen more frequently in both patient groups relative to controls. In patients with the microscopic colitis syndrome, serological tests for celiac sprue were weakly positive in 17%; mild inflammation of the small intestine without villous atrophy was present in 43%, and inflammation plus partial or subtotal villous atrophy was present in 27%. CONCLUSIONS: A shared set of predisposing HLA-DQ genes account for the epidemiological overlap of celiac sprue and microscopic colitis. Mild to moderate mononuclear cell inflammation of the small intestine, often accompanied by partial or subtotal villous atrophy, is frequent in patients with the microscopic colitis syndrome. Although further studies will be necessary to determine if this enteropathy is induced by dietary gluten, we speculate that the small intestinal but not colonic histopathology in patients with microscopic colitis is caused by immunological gluten sensitivity.
Gluten ataxia in perspective: epidemiology, genetic susceptibility and clinical characteristics.

*Brain*. 2003 Sep;126(Pt 9):E4; 685-691

Hadjivassiliou M, Grunewald R, Sharrack B, Sanders D, Lobo A, Williamson C, Woodroofe N, Wood N, Davies-Jones A. Department of Neurology, The Royal Hallamshire Hospital, Sheffield, UK. m.hadjivassiliou@sheffield.ac.uk

We previously have described a group of patients with gluten sensitivity presenting with ataxia (gluten ataxia) and suggested that this disease entity may account for a large number of patients with sporadic idiopathic ataxia. We have therefore investigated the prevalence of gluten sensitivity amongst a large cohort of patients with sporadic and familial ataxia and looked at possible genetic predisposition to gluten sensitivity amongst these groups. Two hundred and twenty-four patients with various causes of ataxia from North Trent (59 familial and/or positive testing for spinocerebellar ataxias 1, 2, 3, 6 and 7, and Friedreich's ataxia, 132 sporadic idiopathic and 33 clinically probable cerebellar variant of multiple system atrophy MSA-C) and 44 patients with sporadic idiopathic ataxia from The Institute of Neurology, London, were screened for the presence of antigliadin antibodies. A total of 1200 volunteers were screened as normal controls. The prevalence of antigliadin antibodies in the familial group was eight out of 59 (14%), 54 out of 132 (41%) in the sporadic idiopathic group, five out of 33 (15%) in the MSA-C group and 149 out of 1200 (12%) in the normal controls. The difference in prevalence between the idiopathic sporadic groups and the other groups was highly significant (*P* < 0.0001 and *P* < 0.003, respectively). The clinical characteristics of 68 patients with gluten ataxia were as follows: the mean age at onset of the ataxia was 48 years (range 14-81 years) with a mean duration of the ataxia of 9.7 years (range 1-40 years). Ocular signs were observed in 84% and dysarthria in 66%. Upper limb ataxia was evident in 75%, lower limb ataxia in 90% and gait ataxia in 100% of patients. Gastrointestinal symptoms were present in only 13%. MRI revealed atrophy of the cerebellum in 79% and white matter hyperintensities in 19%. Forty-five percent of patients had neurophysiological evidence of a sensorimotor axonal neuropathy. Gluten-sensitive enteropathy was found in 24%. HLA DQ2 was present in 72% of patients. DQ1 accounts for 20% of the gluten ataxia patients. Gluten ataxia is therefore the single most common cause of sporadic idiopathic ataxia.

Gastrointestinal symptoms were present in only 13%. MRI revealed atrophy of the cerebellum in 79% and white matter hyperintensities in 19%. Forty-five percent of patients had neurophysiological evidence of a sensorimotor axonal neuropathy. Gluten-sensitive enteropathy was found in 24%. HLA DQ2 was present in 72% of patients. DQ1 accounts for 20% of the gluten ataxia patients. Gluten ataxia is therefore the single most common cause of sporadic idiopathic ataxia. Antigliadin antibody testing is essential at first presentation of patients with sporadic ataxia.
References:
Fortification of Grain?

In the United States, manufacturers of cereals, rices, breads and other grains are federally required to fortify their products with the mineral iron and several B vitamins. In 1943 the government mandated that grain products be fortified with niacin, riboflavin, thiamine and iron, while 1998 saw folate added to this list of nutrients. The addition of these nutrients into everyday products was undertaken to reduce the incidence of beriberi, pellagra, birth defects and other issues.
Traditional Gluten Free Diets Fail

Researchers give the traditional gluten free diet an F...

In this study only 8% of the patients recovered from intestinal damage while following a traditional gluten free diet.

"""

After a median 16 months GFD, 38 (8%) patients had histological ‘normalization’, 300 (65%) had ‘remission’ with persistent intraepithelial lymphocytosis, 121(26%) had ‘no change’ and 6 (1%) had ‘deterioration’.

Source:
Why are Gluten Free Diets Failing to Heal So Many Patients?

A recent study published in the American Journal of Gastroenterology finds that more than 30% of patients with celiac disease following a gluten free diet fail to exhibit recovery of intestinal damage after 5 years on a gluten free diet.

“Mucosal recovery was absent in a substantial portion of adults with CD after treatment with a GFD. There was a borderline significant association between confirmed mucosal recovery (vs. persistent damage)."

Source:
The American Journal of Gastroenterology, (9 February 2010)
Let's take a closer look:

1. The Cardinal Rule – One cannot achieve or maintain health eating unhealthy foods.
2. Processed and packaged food is not healthy regardless of whether or not the label claims to be gluten free.
3. Eating unhealthy foods leads to poor health (I know, this should be a no brainer).
4. Many over the counter packaged foods contain cross contamination of gluten.
5. Many “gluten free” products contain other types of grain based glutens that have not been adequately studied to be safe for those with gluten sensitivity (see video tutorial #1 for more on this).
6. Most processed “gluten free” products contain genetically modified grains, high amounts of sugar, and are devoid of any significant nutrient density.
Gluten Free Whiplash

Going gluten free can be a saving grace for many. However, a common clinical manifestation called 
Gluten Whiplash occurs for many who do not go TRUE gluten free.

The Gluten Whiplash Effect typically occurs 3-6 months after starting a gluten free diet. Let me explain. When one initially goes gluten free, a state of dietary distress and confusion sets in. Many limit their diets to an extreme because they are not quite sure what to eat. The typical gluten free diet learning curve takes 8-12 weeks. This is because one must spend enough time educating themselves about acceptable products, restaurants, etc. During this time, the body starts to heal and most people do very well noticing dramatic improvements in their health.

Once the learning curve is conquered, people tend to gravitate toward the processed, packaged “gluten free” food items. People tend to get lazy and make the choice of convenience over health. BIG MISTAKE! This is where Gluten Whiplash tends to set in.
Modern Wheat Breeding Increases Celiac Disease Occurrence?

New research claims that the toxicity of wheat gluten potentially worsened by cross breeding different strains…

“suggests that modern wheat breeding practices may have led to an increased exposure to CD epitopes

Source:
1. Genetic manipulation of grains – no long term research has been done on safety, yet we assume these foods are OK contrary to common sense. Many studies show these foods to be dangerous.

2. The pervasive use of grains in the food supply. Almost all packaged foods contains grain either as a main ingredient or an agent to alter food texture, viscosity, etc. More grain exposure = more people reacting to grain.

3. The use of herbicides, pesticides, fungicides, etc. Much like genetically modified foods, these chemicals are used under the assumption that they are safe.

4. Over use of antibiotics. Although life saving if one has a bacterial infection, the over utilization of these drugs contributes to a change in the normal healthy gut flora thus weakening the immune system. Additionally, we feed them to chickens, pigs, cows, and fish that are being raised for human food consumption.

5. Anti-acid medications. Nexium, Tums, Prilosec, Rolaids, and more, these drugs suppress acid in the stomach. Acid suppression weakens the immune system and leads to wide spread malabsorption of nutrients.

6. Non steroidal anti-inflammatory medications (NSAIDS). These medications contribute to the destruction of the gastric and intestinal lining thus weakening immunity and predisposing one to intestinal permeability (leaky gut syndrome).

7. Medications in general. Many OTC and prescription medications contain grain based adhesives. Sick from gluten? Take this pill (with gluten in it) and you will get better?!

8. Grain is cheap food. The government subsidizes grain making it much less expensive to use as a staple food.

9. Commercialization. Everywhere you look, there is a billboard, TV commercial, nutritionist, Food Guide Pyramid, etc telling us how healthy whole grains are.

10. Degradation of the eduction system. Public schools focus on teaching students how to pass standardized tests. Nutrition and physical education are given minimal time in the classroom. Many of those teaching nutrition do not lead by example thus devaluing the lesson. The nutrition basics taught focus on a Food Guide Pyramid based in grain.
What about corn?

“Maize prolamines had low but definite activity even though maize is reported to be harmless”

_Gut_, 1983, 24, 825-830
"It is of interest that patients with coeliac disease on a gluten-free diet had a lower incidence of wheat, but not of maize, antibodies when compared with those patients not on a diet."
mTG treatment increased reactivity to wheat and maize prolams in patients with celiac disease...
Bovine milk intolerance in celiac disease is related to IgA reactivity to α- and β-caseins

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Centro de Investigación en Alimentación y Desarrollo, A. C., Carrera a La Victoria, Hermosillo, Sonora, Mexico
Manuscript received October 16, 2008; accepted January 9, 2009.

Abstract
Celiac disease is an autoimmune disease triggered mainly by ingestion of wheat gluten proteins. However, some other dietary proteins, such as those of cow’s milk, induce celiac disease-like symptoms in some patients with celiac disease. Different approaches have been done to detect the component responsible for this problem, including the possibility of gluten peptides present in cow’s milk. © 2009 Elsevier Inc. All rights reserved.

In a recent issue of Nutrition [1], intolerance to bovine milk of some patients with celiac disease (CD) was reported to not be due to the presence of epitopes from wheat gluten. In the excellent work by Dekking et al. [1], the investigators did not detect gluten proteins or peptides in bovine milk from cows fed diets containing large amounts of wheat. Thus, it was demonstrated that the symptoms seen in patients with CD after cow’s milk consumption are not related to gluten proteins in bovine milk coming from wheat.

Keywords:
Bovine caseins; Immunoglobulin A reactivity; Celiac disease

the serum IgA response of patients with CD to bovine milk could be related to gliadins and caseins sharing epitopes recognized by antigliadin IgA antibodies, as previously proposed.

Figure 1 shows the gliadins (Fig. 1A, lane 2) and bovine caseins (Fig. 1B, lane 2) electrophoretic patterns and their respective immunodetections with serum IgA from patients with CD (lane 3 for gliadins in Fig. 1A and lane 3 for caseins in Fig. 1B). As expected, there was a clearly different electrophoretic mobility for the two protein types. In Figure 1A, lane 2, gliadins had a molecular weight from 40 and 28 kDa (Fig. 1B, lane 3), but not κ-casein near 30 kDa. The minority fraction of caseins, κ-casein, has the higher antigenicity for milk-intolerant individuals [7]. Therefore, the IgA immunoreactivity found against α- and β-caseins is not attributable to antigenicity.

Previous studies [2,3] have demonstrated a reaction to caseins, although these were mixtures of α-, β-, and κ-caseins and probably other milk proteins; however, a distinctive identification had not been done. It has been published that there is a high homology of some peptides in bovine β-casein to the gluten peptide, mainly with the amino acid...
“The observation that corn gluten challenge induced an abnormal NO reaction in some of our patients with CD is intriguing as maize is considered safe and is recommended as the substitute cereal in a gluten free diet.”

Gut 2005;54;769-774
“The allergens in rice, corn, millet and buckwheat should be better studied before they can be recommended as alternatives for cereal allergic children.”

“High titres were also found when coeliac sera were tested against wheat glutenins, albumins, and globulins, as well as against barley, oats, and maize prolamines”


*In this case, corn flakes triggered her symptoms!*
Recent Studies on Rice…


“Causative foods for the 35 children were rice ($n = 14$), soy ($n = 12$), cow’s milk ($n = 7$), vegetables and fruits ($n = 3$), meats ($n = 2$), oats ($n = 2$), and fish ($n = 1$). In the 66 episodes, vomiting was the most common clinical feature (100%), followed by lethargy (85%), pallor (67%), and diarrhea (24%). A temperature of <36°C at presentation was recorded for 24% of episodes.”

Gluten Aside. Isn’t Grain Supposed to Be Healthy?

- The food guide pyramid recommends up to 11 servings per day with 50% coming from whole grain sources.
Isn’t Grain Supposed to Be Healthy?

• The seeds are sprayed with fungicides and insecticides.
  • Xenoestrogens which effect hormone balance and contribute to many diseases (breast cancer, endometriosis, fibrocystic breasts)
Isn’t Grain Supposed to Be Healthy?

• The seeds are doused with hormones to aid in growth
• The grains are stored in bins sprayed with additional pesticides
• Drying of the grain causes damage to it’s proteins
• Processing adds…
  • Dough conditioners
  • Preservatives
  • Soy flour
  • Extrusion creates acrylamide
  • Hydrogenated oils
Nutrient Properties of Grains

• Poor source of protein leads to inadequate growth (archeological fossil records show reduction in stature and osteoporosis with the introduction cereal grain based diets)
• Low in EPA and DHA
• Contain Anti-nutrients
• Contain Autoimmune inducing peptides for genetically susceptible individuals
Hormonal influences linked to obesity

- Much like sugar, Grains cause insulin excess...
  - Tells the body to store fat
  - Prevents muscle building
  - Reducing vitamin C uptake into white blood cells
  - Causes magnesium loss
    - Leads to cyclical hypertension (muscle constriction)
  - Sodium retention and excess
    - Contributes to congestive heart failure
What about infant cereals?
So What Do I Eat?

**Meat** – any variety is ok. You must consider the source of the animal. In the case of animal based foods you are not what you eat, you’re what you eat eats!

- **Beef** – should come from grass fed animals.
- **Fish** – Should be wild caught not farm raised.
- **Poultry and eggs** – should be free range organic.
• Dairy
  • Only from grass fed (grazing animals). Raw dairy from a reputable farm is recommended.

• Fruits and Vegetables
  • Any organic variety that you are not allergic to.

• Nuts, non grain seeds, and beans
  • Any organic variety that you are not allergic to.

• Processed food including processed food labeled “gluten free” are better left avoided.
Gluten contamination of grains, seeds, and flours in the United States: a pilot study.

“Twenty-two inherently gluten-free grains, seeds, and flours not labeled gluten-free were purchased in June 2009 and sent unopened to a company who specializes in gluten analysis. All samples were homogenized and tested in duplicate using the Ridascreen Gliadin sandwich R5 enzyme-linked immunosorbent assay with cocktail extraction… Nine of 22 (41%) samples contained more than the limit of quantification, with mean gluten levels ranging from 8.5 to 2,925.0 ppm. Seven of 22 samples (32%) contained mean gluten levels >/=20 ppm and would not be considered gluten-free under the proposed FDA rule for gluten-free labeling. Gluten contamination of inherently gluten-free grains, seeds, and flours not labeled gluten-free is a legitimate concern.”

If the following terms are found on the food label or ingredient list the food should be avoided:

- Malt
- Wheat
- Gluten
- Barley
- Rye
- Oats
- Teff*
- Sorghum*
- Buckwheat***
- Amaranth***
- Quinoa***
- Spelt*
- Rice*
- Corn or maize*
- Millet*
- Triticale (wheat hybrid)*
Processed foods are not recommended!

- Textured vegetable protein **
- Hydrolyzed plant protein **
- Extenders and binders **
- Hydrolyzed vegetable protein **
- Modified Food Starch**
- MSG**
- Natural Flavors**

*These grains are classically considered gluten free, but are not recommended on a TRUE gluten free diet.

** These items are only found in processed food items.

*** These items are technically not grains, but are at high risk for cross contamination and not recommended on a TRUE gluten free diet unless verification can be obtained. These pseudo cereals are also very high in glutamic acid and should be discouraged as substitutes for patients with neurological symptoms.
Additional Recommendations

Because gluten sensitivity has been shown to cause malabsorption of vitamins, minerals, and other nutrients, it is recommended that you see your doctor to be tested for nutritional deficiencies. Spectracell labs has the most comprehensive and scientifically advanced test available. You can visit their website @ www.spectracell.com to find physicians in your area capable of performing the testing for you.
GLUTEN SENSITIVITY, MIGRAINE HEADACHES, AND CHRONIC FATIGUE
LABORATORY REPORT

Account Number: 191473
Name: [redacted]
Gender: Female
DOB: 07/24/1950
Accession Number: K59843
Requisition Number: 378167
Date of Collection: 08/01/2011
Date Received: 08/02/2011
Date Reported: 08/11/2011

Summary of Deficient Test Results

Micronutrient analysis (WBC) determined the following deficiencies:

Calcium  Zinc  Spectrox

Irritable Bowel Syndrome, Gluten Sensitivity

John F. Crawford, Ph.D.
Laboratory Director

CLIA# 45D0710715

All tests performed by SpectraCell Laboratories, Inc. * 10401 Town Park Drive Houston, TX 77072
Tel: (713) 621-3101 * Toll-free: (800) 227-LABS (5227) * Fax: (713) 621-3234 * www.spectracell.com
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### Summary of Deficient Test Results

Micronutrient analysis (WBC) determined the following deficiencies:

- Pantothenate
- Biotin

**Antibiotic induced waisting, muscle pain, IBS (diarrhea)**
Summary of Deficient Test Results

Micronutrient analysis (WBC) determined the following deficiencies:

Zinc    Magnesium    Selenium    Vitamin E
Spectrox

This patient was diagnosed with the following:
Gluten Sensitivity
Hypothyroidism
Type II Diabetes
This gluten sensitive patient was diagnosed with PCOS, obesity, and chronic muscle pain.
<table>
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<th>Micronutrient analysis (WBC) determined the following deficiencies:</th>
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<td>Vitamin B12</td>
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<td>Spectrox</td>
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**Gluten Sensitivity - Chronic anemia, IBS, muscle pain, and intermittent fainting**

John F. Crawford, Ph.D.
Laboratory Director
Before seeing me, this patient was diagnosed with idiopathic peripheral neuropathy, depression, hypothyroid, and migratory joint pain.
Additional Recommendations

Gluten can cause leaky gut syndrome. Because of this, many people develop additional food allergies. Measuring for food allergies is an important next step to help to determine what other dietary exposures are contributing to disease.
Have Family Members Genetically Tested!
For more information and for physician affiliate inquiries:
Contact Dr. Osborne or visit
www.GlutenFreeSociety.org
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