Gluten in Medications & Heart Health

Special guest:

Steve Plogsted
PharmD, BCNSP, CNSC

Janelle Smith
CDF Registered Dietitian Nutritionist

February 11, 2015
12 pm PST
Today’s Webinar

- Gluten in Medications with Steve Plogsted, PharmD
- Heart conditions in Celiac Disease
- Taking care of your heart
Steve Plogsted, PharmD, BCNSP, CNSC

- Clinical pharmacist at Nationwide Children’s Hospital in Cleveland, OH
- Involved in celiac disease since 1995, providing expert advice on gluten in medications
- Glutenfreedrugs.com
MEDICATIONS AND GLUTEN

Steve Plogsted, PharmD, BCNSP, CNSC
Excipients can be obtained *from any starch source*, but are primarily derived from:

- Corn
- Potato
- Tapioca

However, they have also been known to contain starch from **wheat**
The following are the most commonly used excipients in U.S.-manufactured drug products:

<table>
<thead>
<tr>
<th>Excipient</th>
<th>Quantity/Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium Stearate &gt;2500</td>
<td></td>
</tr>
<tr>
<td>Lactose &gt;2000</td>
<td></td>
</tr>
<tr>
<td>Microcrystalline Cellulose &gt;1500</td>
<td></td>
</tr>
<tr>
<td>Starch (corn)</td>
<td></td>
</tr>
<tr>
<td>Silicone Dioxide</td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td></td>
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<tr>
<td>Stearic Acid</td>
<td></td>
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<tr>
<td>Sod Starch Glycolate</td>
<td></td>
</tr>
<tr>
<td>Gelatin</td>
<td></td>
</tr>
<tr>
<td>Talc</td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
</tr>
<tr>
<td>Povidone</td>
<td></td>
</tr>
<tr>
<td>Pregelatinized Starch</td>
<td></td>
</tr>
<tr>
<td>Hydroxypropyl Methylcellulose</td>
<td></td>
</tr>
<tr>
<td>Coatings and Ink</td>
<td></td>
</tr>
<tr>
<td>Croscarmellose</td>
<td></td>
</tr>
<tr>
<td>Hydroxypropyl Cellulose &gt;250</td>
<td></td>
</tr>
<tr>
<td>Ethycellulose</td>
<td></td>
</tr>
<tr>
<td>Calcium Phosphate</td>
<td></td>
</tr>
<tr>
<td>Crospovidine</td>
<td></td>
</tr>
<tr>
<td>Shellac (and Glaze)</td>
<td></td>
</tr>
<tr>
<td>Calcium Stearate</td>
<td></td>
</tr>
</tbody>
</table>
Starch

- US FDA regulations state that any product (used in drug manufacturing) labeled as starch can be derived from any source.

- Food starch is derived from corn only.
Pregelatinized Starch

- A starch that has been chemically or mechanically processed. The starch can come from corn, wheat, potato or tapioca. Pregelatinized starch is a processed carbohydrate, used as a texturizer and/or binder. It is typically derived from corn, waxy corn, potato, or tapioca. It has nothing to do with gelatin. It is safe for vegetarians and vegans.
Sodium Starch Glycolate

- Sodium salt of carboxymethyl ether of starch. Usually from potato but can be from corn, wheat or rice.
4016 package inserts
1320 (33%) had “starch” as an ingredient
- 399 pregelatinized starch
- 53 pregelatinized starch (corn)
- 383 corn (maize) starch
- 141 starch
- 8 potato starch
- 3 wheat starch
- 324 sodium starch glycolate
Maltodextrin-Wheat
(from the Glutenfree Dietitian Tricia Thompson)

- Wheat starch is not wheat grain and is not wheat protein
- Wheat starch hydrolysates (ie, maltodextrin and glucose syrups) have been tested to be below 20 PPM
- Benefiber, which contains wheat dextrin, has been tested by the Gluten Free Watchdog organization and is considered safe for celiacs
Clan Thompson

- Mannitol: Gluten free: Yes. Vegetarian: Yes. Comments: Commercially produced by the electrolytic reduction or transition of sugar solutions or by fermentation of sugars. Can be produced from maltose. Although maltose is derived from barley - mannitol is refined so no protein remains in the final product.
Polyols/Sugar Alcohols

- Sugar alcohols or polyols, as they are also called, have a long history of use in a wide variety of foods.
- Sugar alcohols are neither sugars nor alcohols. They are carbohydrates with a chemical structure that partially resembles sugar and partially resembles alcohol, but they don’t contain ethanol as alcoholic beverages do.
The polyols commonly used include sorbitol, mannitol, xylitol, maltitol, maltitol syrup, lactitol, erythritol, isomalt and hydrogenated starch hydrolysates.

Sugar alcohols occur naturally in a wide variety of fruits and vegetables, but are commercially produced from other carbohydrates such as sucrose, glucose, and starch.
Other Sources-The Drug Itself?

- Olmesartan (Benicar)
- Report of gluten like enteropathy
- 22 patients reported (Mayo Clinic)
- Biopsies demonstrated villous atrophy and varying degrees of inflammation
- tTG antibodies were normal
Benicar® (olmesartan)

- Mayo Clinic reported on 22 patients taking the drug long term who developed severe celiac symptoms and intestinal changes that mimicked celiac disease.

- The drug contained the following fillers:
  - hydroxypropyl cellulose, hypromellose, lactose monohydrate, low-substituted hydroxypropyl cellulose, magnesium stearate, microcrystalline cellulose, talc, titanium dioxide, and (5 mg only) yellow iron oxide.
What about injectable drugs

- Generally not a problem
- Minimal excipients
- Not ingested
Sources of Information

- Pharmaceutical manufacturer’s drug information department
- Package insert
- Drug company web site
- Internet web sites
- Chat rooms/Blogs
- Your local pharmacist?
  - Besides asking the pharmacist about the gluten status don’t forget to ask if the drug itself will cause intestinal issues
Internet Resources

- Glutenfree Drugs
  [http://www.glutenfreedrugs.com](http://www.glutenfreedrugs.com)

- Celiac Sprue - A Guide Through the Medicine Cabinet, by Marcia Milazzo,
  [http://www.celiacmeds.com](http://www.celiacmeds.com)

- Wheaton Gluten Free Support Group

- DailyMed - Provides high quality information about marketed drugs (US)

- Pillbox – Provides a way to search by ingredient
NIH/NLM Pillbox Website

- Starch-8739 records
- Corn-6518 records
- Sodium Starch Glycolate-3207 records
- Potato-2934 records
- Maltodextrin-844 records
- Lactose-7955 records
- Soy-368 records
- Wheat-11 records
Identify or Search for a Pill

- **Imprint:** letters or numbers on either side of the pill
  - Pill does not have an imprint.
- **Shape:** Select Shape
- **Color:** Select Color
- **Size:** Select Size (search +/− 2mm)
- **Score:** Unknown, 1, 2, 3, 4
- **Drug Name or Ingredient(s):**
- **Inactive Ingredient(s):** Find pills WITHOUT this ingredient.
- **Label Author:**
- **DEA Schedule:** Select DEA Schedule
- **Product Code:**

Do not search repackaged and relabeled medications

[Search] [Clear]
Search Results: 11 record(s) for "wheat".

1. **Name:** Tekturna HCT (aliskiren 150 MG / HCTZ 12.5 MG) Oral Tablet  
   **Ingredient(s):** Aliskiren mixture with Hydrochlorothiazide  
   **Imprint:** NVR;LCI  
   **Label Author:** Novartis Pharmaceuticals Corporation  
   **Show More Information**  

2. **Name:** Tekturna HCT (aliskiren 300 MG / HCTZ 12.5 MG) Oral Tablet  
   **Ingredient(s):** Aliskiren mixture with Hydrochlorothiazide  
   **Imprint:** NVR;CVI  
   **Label Author:** Novartis Pharmaceuticals Corporation  
   **Show More Information**  

3. **Name:** Grifulvin V 500 MG Oral Tablet  
   **Ingredient(s):** Griseofulvin  
   **Imprint:** ORTHO;214  
   **Label Author:** Ortho-McNeil Pharmaceuticals  
   **Show More Information**  

4. **Name:** Sanctura 20 MG Oral Tablet  
   **Ingredient(s):** Trosplum  
   **Imprint:** S  
   **Label Author:** Allergan, Inc.  
   **Show More Information**
<table>
<thead>
<tr>
<th><strong>Name:</strong> Tekturna HCT (aliskiren 150 MG / HCTZ 12.5 MG) Oral Tablet</th>
<th><strong>Ingredient(s):</strong> Aliskiren mixture with Hydrochlorothiazide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imprint:</strong> NVR;LCI</td>
<td><strong>Label Author:</strong> Novartis Pharmaceuticals Corporation</td>
</tr>
<tr>
<td><strong>Color(s):</strong> White</td>
<td><strong>Shape:</strong> Oval</td>
</tr>
<tr>
<td><strong>Shape:</strong> Oval</td>
<td><strong>Size (mm):</strong> 15.00</td>
</tr>
<tr>
<td><strong>Size (mm):</strong> 15.00</td>
<td><strong>Score:</strong> 1</td>
</tr>
<tr>
<td><strong>Inactive Ingredient(s):</strong> silicon dioxide / crospovidone / hypromelloses / ferric oxide red / lactose / magnesium stearate / cellulose, microcrystalline / polyethylene glycols / povidone / talc / titanium dioxide / starch, wheat</td>
<td><strong>DEA Schedule:</strong> Non-scheduled</td>
</tr>
<tr>
<td><strong>DEA Schedule:</strong> Non-scheduled</td>
<td><strong>Product Code:</strong> 0078-0521</td>
</tr>
</tbody>
</table>
Contacting the Drug Manufacturer

- Ask specific questions
  - Does the medication contain any gluten
  - Does the drug contain any starch
  - Is there any special coating
Heart Health
What heart conditions are related to celiac disease?

- Arrhythmias
- Ischemic heart disease
- Idiopathic dilated cardiomyopathy – 5.7% risk in those with CD

And now….. coronary artery disease
Risk of CAD in Celiac Disease


<table>
<thead>
<tr>
<th>Age</th>
<th>CAD prevalence in CD (n=24,530)</th>
<th>CAD prevalence without CD (n=22.35 million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages 18+</td>
<td>9.5</td>
<td>5.6</td>
</tr>
<tr>
<td>&gt;65 yo</td>
<td>28.6</td>
<td>13.2</td>
</tr>
<tr>
<td>18-65 yo</td>
<td>4.5</td>
<td>2.4</td>
</tr>
</tbody>
</table>

- Risk of stroke 1.4 times higher
“People with celiac disease have some **persistent low-grade inflammation** in the gut that can **spill immune mediators into the bloodstream**, which can then accelerate the process of atherosclerosis and, in turn, CAD”

Risk also seen in “other inflammatory states like lupus erythematosus, rheumatoid arthritis, and inflammatory bowel disease”

– Dr. Rama Dilip Gajulapalli, Cleveland Clinic, OH
Atherosclerosis & CAD

- Inflammatory cells circulating through the blood stream can damage walls
- Healing process hardens, creates plaque
- Can burst, form blood clot and block blood flow
Protecting your Heart

Follow the gluten-free diet if you have CD!

- Minimal gluten intake may perpetuate low-level chronic inflammation....?

- Degree of villous atrophy seems to be unrelated to risk of heart disease

Heart-Protective Diet

Balance omega-3’s with omega-6’s

- Polyunsaturated fatty acids found in both plant and animal sources

- Omega-6’s are more common in US diet:
  - Vegetable oil, butter, lard
### Fatty acid content of different fat sources

<table>
<thead>
<tr>
<th>DIETARY FAT</th>
<th>SATURATED FAT</th>
<th>POLYUNSATURATED FAT</th>
<th>MONOUNSATURATED FAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola oil</td>
<td>7</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Safflower oil</td>
<td>8</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Flaxseed oil</td>
<td>9</td>
<td>16</td>
<td>57</td>
</tr>
<tr>
<td>Sunflower oil</td>
<td>12</td>
<td>71</td>
<td>1</td>
</tr>
<tr>
<td>Corn oil</td>
<td>13</td>
<td>57</td>
<td>1</td>
</tr>
<tr>
<td>Olive oil</td>
<td>15</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Soybean oil</td>
<td>15</td>
<td>54</td>
<td>8</td>
</tr>
<tr>
<td>Peanut oil</td>
<td>19</td>
<td>33</td>
<td>*</td>
</tr>
<tr>
<td>Cottonseed oil</td>
<td>27</td>
<td>54</td>
<td>*</td>
</tr>
<tr>
<td>Lard</td>
<td>43</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Palm oil</td>
<td>51</td>
<td>10</td>
<td>*</td>
</tr>
<tr>
<td>Butter</td>
<td>68</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Coconut oil</td>
<td>91</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

- **Saturated Fat**
- **Polyunsaturated Fat**
  - linoleic acid (an omega-6 fatty acid)
  - alpha-linolenic acid (an omega-3 fatty acid)
  - oleic acid (an
Heart-Protective Diet

- Omega-6 fatty acids are precursors to inflammatory response
- Eating enough omega-3’s may slow down/limit the inflammation response to life

Sources of Omega-3 fatty acids:
- Fish oil
- Flaxseed
- Walnuts
- Soybeans
- Canola oil
Benefits of Omega-3’s

• Lower blood triglycerides (another risk factor for heart disease)
• Improve brain health:
  o for growing infants and children
  o for the aging – dementia, Alzheimer’s
• Mental health and depression
• Decrease inflammation in autoimmune diseases?
Fish oil is utilized better than vegetable oils

Recommended dose:
1000 mg/day

DHA, EPA

ALA
Help you to get more plant and fish sources of fatty acids
• By default, decrease ratio of animal and omega-6 fatty acids
• Decrease dietary cholesterol and saturated fat
• Increase phytosterols – plant “cholesterol” – that block absorption of dietary cholesterol

Meatless Mondays & Fatty Fish Fridays

Celiac Disease Foundation
celiac.org
Fatty Fish

- Salmon (wild is higher in omega-3’s)
- Anchovies
- Bluefish
- Herring
- Mackerel
- Sardines
- Sturgeon
- Lake trout
- Tuna
More on plants and antioxidants

- Get 7 servings/day of fruits and vegetables
- Neutralize free radicals that would roam the body and damage cardiovascular system
Limit Sodium & Simple Sugars

- Sugar intake known to increase triglycerides and disrupt LDL/HDL balance
- Excess salt contributes to high blood pressure

- Choose whole foods over packaged foods
- Cook at home more than eating out
Physical Activity

• Take a walk on your lunch break
• Stand up at work and stretch 10 minutes/day
• If you’re already active: balance your type of activity
• Incorporate yoga and stretching
Next CDF Ask the Dietitian Webinar:

To be announced