Crohn’s Disease
By Tanya Welch and Taylor Shepard

Introduction:
Crohn’s Disease (or inflammatory bowel disease (IBD)) because it is most commonly known for affecting the intestines. Even though it is most popular in the intestines, it may occur anywhere along the GI tract which makes it hard to locate and treat at the root. The disease is harmful to the intestines because it causes breaks in the lining (in section of the small intestine) and the colon (the main part of the large intestine). In some cases, the intestine will be punctured, causing necrosis to occur within the body tissue. This can lead to infection and inflammation. Male and women are equally affected by the disease. Siblings and Crohn’s is usually diagnosed in young adults, however it can occur at any age.

CLASSIFICATIONS
Crohn’s disease classified as an autoimmune disease because it affects the gastrointestinal tract. Because the GI tract is so long, Crohn’s Disease may affect different parts of the intestine. There are three main types of Crohn’s Disease based on where they affect:

- Crohn’s ileitis (also affects the ileum)- Only the Ileum is affected, not the Colon
- Crohn’s ileocolic (affects both the Ileum and Colon)- Both the Ileum and Colon are affected
- Crohn’s colitis (affects the Colon only)- Only the Colon is affected

Research for the cause of Crohn’s disease is still pending, but scientists have found a strong genetic link. Siblings, males and females, have an equal chance of getting Crohn’s. A study has shown that smokers are three times more likely to be diagnosed with Crohn’s. Scientists have also found a strong connection between the NOD2 (also known as CARD15) gene and Crohn’s Disease. The mutation in this gene, which is located on q12 of chromosome 16, is what scientists believe to be the cause of the genetic disease.

The NOD2 gene’s normal function is to provide instruction for the making of the NOD2 protein which is active in some immune system cells. These cells protect the body against harmful bacteria and viruses. The NOD2 protein can be found on the epithelial cells, which are found along the lining of the intestine. These epithelial cells defend the intestinal wall against infection. Many types of bacteria live in the digestive system, but most are harmless. An example of harmless bacteria would be the bacteria that help digest foods. NOD2’s function is to recognize the harmful bacteria in the GI tract and trigger the immune system to respond properly.

More than 38 variations in the NOD2 gene have been associated with Crohn’s disease. (1), (2), (3) or (4), in the latest confirmed mutation. This mutation causes a shorter version of the NOD2 protein to be formed. Other mutations can cause changes in a single amino acid in the NOD2 protein. Arg702Trp (R702W) and Gly908Arg (G908R) are two other mutations that scientists have recently found to be connected with Crohn’s Disease. However, they have only be found in 5% of patients with the disease. Scientists have not yet found out how these genetic changes increase the risk of developing Crohn’s Disease. They have hypothesized that changes in the NOD2 gene prevent the protein from recognizing harmful bacteria, allowing the bacteria to grow and invade the cells lining the intestine. This disease also causes the overproduction of Il-10 and TGF-β (which is required specifically to the infection and areas of the intestine which are causing inflammation). Chronic inflammation in the intestine is the cause of the digestive problems caused by the disease. It can become more serious if not treated properly.

Symptoms
Additional pain, which may feel like cramps, is the first symptom of Crohn’s Disease. It is then followed by diarrhea. The diarrhea may, at times, be bloody. Vomiting and bloody may signify the beginning of small bowel obstruction. Pain or tenderness in the areas may be caused by inflammation, or ulcers around the area. Crohn’s Disease can also cause the formation of non-healing sores (ulcers) in the mouth. In cases where Crohn’s affects the esophagus or the esophagus, symptoms would be vomiting, upper abdominal pain, or trouble swallowing.

In addition, Crohn’s Disease will cause weight loss and contain fever. Among adults with the disease, weight loss is very common because they often lose their appetite or just feel better when they don’t eat.

Treatments
Although Crohn’s Disease does not have a cure, there are many different treatment options that will reduce the harm symptoms. There are drug, nutritional, and surgical treatments. Some of the drug treatments include pills and creams, while other treatments include an IV feeding. The variety allows for a better chance of finding the drug that works best for the patient. Some examples are steroids, antibiotics, and antibiotics.

Specific diets have also proven to be effective. Such as the substitution of a high calorie liquid formulas instead of milk. Some reports have stated that during a “flare-up”, certain foods like dairy, bulky grains, hot spices, and alcohol should be avoided.

In many cases of Crohn’s Disease, surgery is a form of treatment. It would only be used to relieve symptoms. There are stricturing disease, fistula disease, and Crohn’s ileitis. Crohn’s ileitis causes narrowing of the intestine which may lead to the difficulty of food transportation. Although Crohn’s Disease affects the entire GI tract, the symptoms vary in range and severity depending on the patients case of Crohn’s.

CCFA
Founded in 1967, CCFA has raised a major portion of funding for Crohn’s and Castle research. Crohn’s and Castle Foundation of America dedicates itself to finding the cure to Crohn’s Disease and Colitis. Since the cure has yet to be found, people volunteer to work and help fundraisers to pay for researching cost. This non-profit organization is very creative in the ways they raise money. There is a sponsorship of the Walk for a Cure, where you can register and gain access to the website. You can sign up and pay your entry fee. Each month you can earn a t-shirt, which you can wear and help raise money for the cure.

For more information visit: https://www.ccfa.org

References:
Crohn’s Disease and Ulceraive Colitis (http://ghr.nlm.nih.gov/gene=nod2)
Genetics Books (Library)
TIFF (Uncompressed) decompressor

Crohn’s Disease Definition (http://www.nlm.nih.gov/medlineplus/crohnsdisease.html)
Google Images (http://images.google.com)
Honor Code
Tanya Welch and Taylor Shepard