

Future Leaders In Healthcare



Research Poster Symposium

January 26, 2018

Booker T. Reaves Library
Charlottesville High School
9:30am - 12:00pm



UNIVERSITY
of VIRGINIA
HEALTH SYSTEM

Symposium Program

9:30am-10am

Refreshments

10:00am-11:30am

Poster Presentations

11:30am-11:45am

Judging

11:45am -11:50am

Opening Remarks:

Brandon Kemp,

Laboratory Research Specialist III, UVA

11:50am-11:55am

Award Winners Announced

11:55am-12:00pm

Closing Remarks:

Dr. Anne Pfister,

Biology II Teacher, CHS

Poster Abstracts And Authors

Why have peanut allergies increased over the years? by: Alonda Clark, Addison Martin, and Judith Zamora

Research was done on peanuts allergies, aiming to find the causes of these allergens and the reasons for their increase over the years. Knowing what the roots of it should be considered important for students and grown ups alike, as it's a lifelong problem of the immune system that people have to somewhat adapt to. For example; one of the most common places for a child to be affected by peanut allergies is their school environment. While schools are taking more precautions and setting more rules, mishaps aren't completely avoidable. Key findings included allergens as a whole originating from hay fever, and discovering allergies became an epidemic across any/all countries as a cause of hygiene and time spent indoors. Increased hygiene, combined with staying inside more, has led to a weakening of the immune system and allows it to become hypersensitive to substances, such as peanuts. Allergies as a whole can't be eradicated, but can at least be weakened and become less of a threat; if children as young as four months old can be introduced to peanuts through means of skin contact in intervals (and build up to eventually being able to intake solid foods containing peanuts) while also receiving immunizations, their immune systems are more likely to build up its tolerance levels (becoming less hypersensitive), and the children can experience less serious reactions to their allergen (such as anaphylaxis, a life-threatening reaction involving the swelling of muscles, especially in the throat, and dropping of blood pressure).

Conditions that Generate Alzheimer's by: Dyshe Smith and Rakeem Davis

Alzheimer is an on-going mental disease that will destroy memory. This condition can not be cured, it is one of the most severe disorders of the brain. Some people deal with a brain disorder called dementia, which is the early stages of Alzheimer's. People are affected mentally and physically. The research explains how Alzheimer's happens, and who is more susceptible to Alzheimer's. Research proves that obese people, people of the ages 40 and older and people with brain injuries are more likely to develop it. Microglia cells naturally prevent Alzheimer's, when cell communication is misled microglia does more damage. In cases of previous brain trauma, misfolded and aggregated proteins appear. Tau Proteins attack the hippocampus which causes the brain to break down which causes the memory loss. An affected brain would have enlarged ventricles, wider gaps between folds in the cortex and prominent atrophy in the hippocampus. Having inflammation in the brain can also be a factor for Alzheimer's and Dementia (AD). Inflammation can work in a positive or negative way. It can assist the brain to clear away the beta-amyloid deposits or triggers a bad cycle that could damage neurons in the brain. It is sad for people to go through this disease of AD as Alzheimer dramatically affects your memory and everyday life. Unfortunately this disease is incurable. Some drugs currently used for AD prevent the breakdown of a brain chemical called acetylcholine that is essential to memory processes.

Comparing Steroidal versus Nonsteroidal Treatments of Chronic Asthma in Children versus Adults by: Kaniyah Key, DaMara Knight, Katherine Wells

In this project, the aim was to unearth different ways of treating asthma by posing the question, how do steroidal and nonsteroidal medicines compare in the treatment of people, comparing children versus adults, with chronic asthma? This is an important topic to consider because roughly 25 million people in the United States have asthma, and yet there is no cure and few treatment paths. The goal was to examine the options available and to provide an eye-opening project that brings awareness to asthma. There are two types of nonsteroidal medicines and one steroidal medicine with two different effects depending on the type used. Each had different benefits and disadvantages; Bronchodilators, or commonly known as 'relief' inhalers, are best used during an asthma attack or if one is about to happen, not long term, Leukotriene modifiers block leukotrienes reducing attacks and the need for other medications but it is a new medication with lots of side effects, and Corticosteroids have three different ways to take it, and prevents future attacks but can take hours to set in rendering it useless for attacks. The best option for children is bronchodilators because it's the easiest to take, while corticosteroids are better for adults because the asthma is better managed for their busy lives. There are around 250,000 deaths per year from asthma, but still there is not a cure or a treatment that works efficiently. How many more people are going to die before there is a cure for asthma?

Gene Therapy Treatment for Cancer: Use of Different Virus Vectors by: Tave Slangerup and Ella Wayland

The topic of the project is the study of gene therapy and its role in fighting cancer. There are strategies to use gene therapy to kill or slow down cancer stem cells. Gene therapy is the injection of a DNA segment into a patient with the purpose of treating a genetic disease. The process of gene therapy goes as follows: the patient has samples of their immune cells taken to a laboratory, where an oncolytic cell is released into it. The cells are then mutated and change their function in the body, which is to target cancer stem cells. After the injection of the oncolytic cell into the patient's cell, it is returned into the patient. Gene therapy in modern-day science has become very successful, and if improved, can permanently cure cancer and other diseases. Gene therapy's research started in 1974, and now with the equipment available in 2017, research is improving. Problems can occur with the patient itself for multiple reasons, an example being because their immune system tries to destroy foreign cells, the body may try to kill it, which is currently being researched to prevent. Another completely different problem is if there is an incorrect amount of DNA put into the patient's immune cells, whether that be too much or too little to carry out the function. In conclusion, gene therapy's potential with cancer can change and possibly cure cancer and other diseases in the future.

Poster Abstracts And Authors

Bringing Awareness to Harlequin Ichthyosis Syndrome by: Kareem Bolden and Vaiana Morgan

This project investigates the rare disease of harlequin syndrome. This rare disease affects mainly 1 in 500,000 adults. Even though it is a rare disease, it is important to bring awareness to Harlequin Syndrome. This disease affects the human skin and causes scaling effects around the face. This syndrome is caused by a genetic mutation or damage to the sympathetic nervous system. When asked what is the disease, most people do not know. So with this project our group wanted to make sure that harlequin syndrome was known and how it affected the people that were diagnosed with the disease. Some people who are diagnosed with the disease complain of the disease causing itchiness and pain while others say their skin feel really rough. There aren't many ways to treat the disease and cannot be fully cure but research has shown that botox injections is likely the most effective. It is rare to have the disease but if people come out and discuss what it is like having the disease I think people will understand how it is to walk around with the disease.

The prevention of HIV in newborns by: Marie Gerald, Kajasha Taylor, and Maya Clark

The project focused on the study of Human Immunodeficiency Virus (HIV). We settled further in the topic by investigating the prevention of newborn HIV infection. HIV is a virus that causes the Acquired Immune Deficiency Syndrome (AIDS) and causes a very weak immune system, forcing the body to not be able to get rid of illnesses. The importance is to know exactly what is being done to fight the spread of the virus in future generations and lower transmission levels. What would the treatment options be? After researching through articles, there seemed to be a couple main solutions. The first being through the process of ART. ART stands for antiretroviral therapy and provides care to an positive mothers. This therapy targets the mother during pregnancy in order to cut off child transmission. Another was regarding C-Section procedures. This is a way of delivering the child, typically 2 weeks ahead of the expected due date, to stop HIV transmission during natural birth. Finally, the last aspect of possible transmissions is breastfeeding. In that case, newborns are fed with milk formula. Luckily, this setback can be fought with a series of antiretroviral drugs, usually for mothers with a more stable immune system. To summarize, the drug treatment is one of the most effective and common ways of prevention and it is highly recommended for any mother or person living with Human immunodeficiency virus.

Influenza Virus: Viral Evolution and Yearly Development of Vaccines by: Hannah Murphy, Jennifer Costilla, and Owen Guiffre

Influenza is a universal respiratory virus that affects more than three million americans each year. The influenza virus has symptoms that usually consists of fever, cough, fatigue, runny nose, and headaches. High risk categories of people such as young children, pregnant women, elderly, people and those with compromised immune systems are more susceptible to become ill from this virus. Because the vaccines are produced in eggs, people with egg or chicken allergies are also at risk. The CDC reports 56,000 influenza related deaths within the United States in years 2012-2013. Throughout researching about this virus and the vaccine process, a striking finding was that making effective vaccines are actually difficult to make. Vaccines are updated twice a year but they are not always accurate to the new strain of virus which is constantly changing. It is recommended that after the age of six months you should be vaccinated yearly. This is a challenge to make the effective vaccine at the right time before the start of the Influenza season and also having people regularly vaccinated. We found that vaccines are made using an egg-based system which has been used for over 70 years mainly due to it is very cheap to manufacture. With it being egg-based many people with egg or chicken allergies can not use this method of being vaccinated, they tend to go for cell-based vaccines which are the future of vaccines for as they made by growing virus in animal cells.

The Causes and Effects Insomnia has on the body by: Calvin McMindes, Nadyia Khaydari, and Dre'Nashia Lee

Insomnia is a common sleep disorder that causes loss of sleep. The project focuses on the causes and the effects insomnia has on the body, specifically the immune system. The research's primary focus was on how the immune system was negatively affected by lack of sleep, and certain factors that could cause insomnia. There is not only one cause for insomnia, therefore it is hard to pinpoint what to look for if you suffer from the disorder. Some causes may be a chemical imbalance in the body, mental disorders, certain diseases such as cancer, and being stressed. Those are just a few examples that could cause insomnia, but there are also certain factors involved that may affect the effects insomnia has on the body. Some factors that may influence insomnia could include age and sex. There are also certain daily activities that can also increase the risks insomnia may have. Insomnia is very dangerous to someone's health because it can affect the immune system's ability to protect the body from illnesses and diseases. The body is more likely to be prone to sickness when it isn't getting the proper rest. Insomnia doesn't just put you at risk for common illnesses such as the cold or flu, but also at a higher risk for prostate cancer, memory diseases, and a higher risk for depression. It is important that insomnia doesn't go undiagnosed because the long term effects this sleep disorder, could be deadly.

Poster Abstracts And Authors

Is childhood leukemia worse than adult Leukemia?
by: C'erra Rhodes, Ben Casarez, and Bruneshia Brown

The poster is focusing on Leukemia and is comparing leukemia in adults and in children. Leukemia is a cancer of the bone marrow and white blood cells. This can cause your body not to be able to fight diseases off and affects the production of red blood cells. Leukemia cells can build up, crowding normal blood cells, and invade other parts of your body. There are different types of leukemia but acute leukemia are the most common. The two main kinds of acute Leukemia are Lymphocytic leukemia and Myelogenous leukemia. Lymphocytic leukemia is when the body makes too many white blood cells called lymphocytes. Myelogenous leukemia is when the body makes too many of white blood cells called granulocytes. 80% of leukemia patients are children. The leukemia can show when the kid is born or later on after they are born. Blood disorder or not the right amount of chromosomes are factors that are more likely to trigger leukemia. For children, latinos have the highest risk factor. For adults, among men: white males have the highest risk factor of getting leukemia (17.5 per 100,000 men, 13.0 black, 12.3 hispanic, 9.4 Asian, 9.2 American indian). For women, white woman had the highest risk factor of getting leukemia (10.6 per 100,000, 8.9 hispanic, 8.4 black, 6.2 asian, 5.3 American Indians.) Leukemia is different between children and adults and is more common in children than in adults.

Malaria in Sub-Saharan Africa:
Socioeconomic Effects on Treatment and Accessibility
by: Amber Gentry, Courtney Snapp, and Olivia Colom

Malaria is defined as “a human disease that is caused by sporozoan parasites (genus Plasmodium) in the red blood cells, is transmitted by the bite of anopheline mosquitoes, and is characterized by periodic attacks of chills and fever”. This epidemic is devastating to the population of the Sub Saharan Africa geographical region which carries 90% of malaria cases worldwide. Research focuses on the disparity in accessibility to effective and inexpensive treatment for Malaria. Sub Saharan Africa is subject to socioeconomic and geographic factors that cause proper (affordable) treatment for their highly prevalent disease to be next to impossible to access. These factors include distance from home to hospital, price of treatment, the frequency of visits for treatment leading to a loss in days spent earning money, and a lack of universal healthcare. Malaria also affects certain demographics within the population more than others, such as children and pregnant women.

What Are the Progressions of Multiple Sclerosis Treatments?
by: Lewis Tate and Kennedy Wardlaw

Treatment progress of Multiple Sclerosis [MS] was researched for the past 5 years, and their side effects as well as the benefits and setbacks. MS is the diseaseThe overall reason for doing this project was to find and bring to light the different types of treatments and medications available for MS. It is imperative that an increase awareness of treatment options be available, because most people who developed MS feel there is no help. The key finding that we found were the new drug Fingolimod, developed in 2011, which is the first ever orally administered FDA approved drug that directly target MS. We also found that since 2004 all treatments and medicines administered for the disease have been FDA approved with very low side effect rate and a very high success in warding off the disease, which is a huge leap forward for the field. In conclusion in finding a way to uncover treatment options and the side effects as well as the availability and the history and evolution of the treatments over time help understand the disease and the challenges patients with MS still face. With the new discovery of Fingolimod, most likely one of the most versatile orally administered drugs in history, not on is MS one step closer to being eradicated but so are many other ailments and diseases.

Potential developments for the treatment of Ovarian Cancer;
chemo, radiation, targeted, and hormone therapy

by: Noah Pyle, Dyamond Poindexter, and Fatima Lopez

In the recent decade, a specific amount of research has been focused on the treating and eventually, the cure of ovarian cancer. Ovarian cancer is one of the most frightening and fatal types of cancers. The Ovarian cancer is usually sprouted from malignant epithelial ovarian tumors, or also known as carcinomas. About 85% to 90% of ovarian cancers are epithelial ovarian carcinomas and normally come in different classes of epithelium such as serous and mucinous. Epithelial ovarian carcinomas are identified by these subtypes, and are also given a grade and a stage. The grade classifies the tumor based on the similarity with the normal tissue on a scale of 1, 2, or 3. Grade 1 epithelial ovarian carcinomas look more like normal tissue and tend to have a better prognosis, or outlook. Grade 3 epithelial ovarian carcinomas look less like normal tissue and usually have a worse outlook. Grade 2 tumors look and act in between grades 1 and 3. The statistics for ovarian cancer in 2017 were about 22,440 women were diagnosed with the disease and about 14,080 died from it. It ranks 5th in cancer deaths among women and the likelihood of a woman being diagnosed with ovarian cancer is about 1 out of 75. The cancer normally develops in women over the age of 63 years old. Luckily the rate at which women are being diagnosed with the cancer has slowly dropped over the last 20 years or so.

Poster Abstracts And Authors

Preventing Premature Birth
by: Lily Deleo, Diana Chavez, Amillion Jones

The causes of premature birth and how they can be prevented are investigated in this project. This is an important topic because it is a serious problem that countless families around the world face. It has been the reason why many newborns die and frequently causes disabilities in children born preterm. These disabilities can include impaired cognitive and motor skills, sight, hearing, behavioral and psychiatric problems, as well as breathing and heart issues. In America, along with many other similarly socially changing countries, the rate of premature babies born continues to increase. Premature births had always occurred due to the complications of individual women's particular situations, genetics and health. However, the recent increase is the result of the older age of American women when they have children and the growing use of fertility treatments used by women who have difficulty getting pregnant or who are older. The wellbeing of babies and lives of women pertaining to birthing age is an open discussion. Most women aren't ready to have kids in their early twenties which is the safest age to do so. So while there is no simple solution, what can be done is to help women at risk for a preterm delivery and helping children and their families affected by it. Organizations such as the March of Dimes that focuses on prevention and assisting people affected by premature birth, fundraise for research and help families with premature-born children.

Treatments of Sickle Cell Anemia For Children In The Last Decade
by: Camden Brown, Tayvion Jacques, and Weedor Kollie

The treatments of Sickle Cell Anemia in children in the last decade were researched. Sickle Cell Anemia is an important topic because it's a genetic disease that affects many. Sickle Anemia affects the red blood cell mutation, and was given its name because of the sickle shape the red blood cells form. Millions of people suffer with this disease, limiting them from doing many activities in their daily life, in some cases death can occur. The treatments that were found were Antibiotic Penicillin, Bone Marrow Transplants, and Hydroxyurea. Antibiotic Penicillin prevents Pneumococcal infection which includes Sinusitis, Meningitis, and Pneumonia and is also the infection of the blood. Hydroxyurea helps relieve pain if taken daily and reduces the necessity of a transfusion or hospitalization. Bone Marrow Transplant also known as Stem Cell Transplant is the best treatment for Sickle Cell Anemia but is also a very risky procedure. It is very dangerous procedure, and will need a donor to continue with the process, which is difficult. In conclusion, this project gives an insight on what Sickle Cell Anemia is. These treatments reduce the pain of this illness. It is very difficult for children because they're not able to live like a child. Most of the children have to stay in hospital and aren't able to do many activities. Scientist still haven't found the best cure that is also safe for patients. There is still research being done to help Sickle Cell Anemia patients to live a more comfortable and longer life.



Acknowledgments:

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