

**Conquering Allergies in Almost Heaven. Educational hub to provide the most up-to-date medical information and access to local allergists and immunologists for referral and treatment.**

Cora Miracle, MD/PhD, MS3

*Mentors:* Mary Beth Hogan, MD, Deborah Preston, BS, Jacob Kilgore, MD, MPH

Atopy is defined as a cluster of allergic disorders including but not limited to asthma, allergic rhinitis, eosinophilic esophagitis, and atopic dermatitis. The prevalence of these disorders is continuing to increase, now affecting roughly 20% of the population. As the prevalence of atopy rises so too does the morbidity and mortality associated with these conditions. Morbidity and mortality include, but are not limited to, anaphylaxis, respiratory failure, upper respiratory infections, pneumonia, and infectious skin diseases. These sequelae result in a large percentage of hospitalizations. West Virginia has one of the highest rates of hospitalization for asthma exacerbations. Our allergy and immunology group has also demonstrated that a unique microclimate exists in West Virginia which fuels other atopic conditions such as allergic rhinitis, eosinophilic esophagitis (EoE), and allergic conjunctivitis (not yet published). Despite our high prevalence rate and unique microclimate, West Virginia only has 5 pediatric board-certified allergists and immunologists statewide. These Allergists are all localized to the major cities of Huntington, Charleston, and Morgantown. This severely limits the care of children within rural West Virginia. West Virginia is home to many low-income families with most patients on Medicare/Medicaid. This makes basic health care costs a strain on many families and makes traveling for care often insurmountable. The aim of this project is to provide an educational hub that is accessible from all areas of West Virginia to help provide the most up-to-date medical information and access to local allergists and immunologists for referrals and guidance, potentially changing the face of allergy and immunology in West Virginia.

**Prevalence of Cancer amongst Young African Americans in Rural West Virginia**

Osa Benjy, MPH, MS2

*Mentor:* Paul Finch, MD

Cancer is 18% more prevalent in young African Americans than other younger races in West Virginia. As a leading cause of death in West Virginia, cancer continues to burden the overall health status of the citizens. With more than 75% of the citizens residing in a rural designated area that has been identified as a health profession shortage area (HPSA), The mortality and morbidity of cancer are even higher in this designated area. Contributing factors to this prevalence are attributed to all but not limited to access to transportation, physician and facility shortages, parents living below the poverty line/lack of health insurance, health illiteracy and stigma, and delayed presentation. Hence, it is imperative to identify and understand any outstanding and additional factors that impact our target population. This study aims to identify the knowledge gap that increases the prevalence of cancer in young African Americans more than other races in the rural population. The data obtained from this study will improve the understanding of the disease

prevalence amongst minorities, hence providing healthcare professionals an opportunity to decrease a significant part of the 3rd highest prevalent disease in the state.

**Factors Contributing to Missed Injuries in Rural and Urban Traumatic Burn Patients: A Retrospective Analysis. Chart review at Cabell. The residents will present outcomes in CME at two rural hospitals.**

Grant Kahley, PGY4, Armein Rahimpour, PGY3

*Mentor:* Curtis Harrison, MD

Traumatic burn patients pose a unique challenge for healthcare providers due to the complex nature of their injuries. While severe burns demand immediate attention, they can potentially distract from the recognition of concurrent traumatic injuries. This retrospective study will examine patients with traumatic burn injuries to determine if there is a prevalence and common characteristics of missed injuries within this patient cohort. This study will also explore whether contributing factors, including infection, comorbidities, BMI, race, gender, referring hospital patient location and age, play a role in the oversight of injuries.

**Patient Satisfaction Outcomes Post Rhinoplasty- A Rural vs. Urban Comparison. The study will result in better understanding of various procedures and the patient satisfaction rating.**

Jacy Baxter, MS3, Armein Rahimpour, PGY3

*Mentor:* Rahmin Berry, MD

Rhinoplasty is one of the most common facial plastic surgeries performed. Many different techniques have been described and employed to use for the procedures. The purpose of this study is to understand the outcomes of the various procedures and impact upon patient satisfaction. A comparison between rural patient satisfaction to the patients from an urban setting will also be made.

**Blood-based Biomarkers for Preeclampsia in Rural Hypertensive Pregnant Patients. Pilot study examining baseline characteristics of blood-based biomarkers in our rural population.**

Emma Nellhaus, PGY2

*Mentor:* Jesse Cottrell, MD

Chronic hypertension during pregnancy is a significant cause of morbidity and mortality for the mother and fetus. The clinical signs of maternal and fetal morbidity due to chronic hypertension are the manifestation of cellular and molecular pathology and pregnancy is associated with significant immuno-modulation. Inflammation due to hypertension plays an important role in stimulating vasoactive pathways, and imbalance and improper immune function is known to both incite and exacerbate the hypertensive disorders of pregnancy.

The FDA has recently approved the first blood-based biomarkers (sFlt-1/PGF ratio) for risk assessment and clinical management of preeclampsia. This lab test is of special interest to our rural population due to the extremely high rates of hypertension in rural West Virginia and distance from appropriate medical care. We hypothesize that these blood-based biomarkers (sFlt-1/PGF ratio among others) will be helpful in the triage of pregnant patients with chronic hypertension to facilities that can appropriately care for both mother and fetus.

Maternal blood will be obtained at the initial visit (12-20 weeks gestation), 28 weeks gestation, and at the time of delivery and analyzed for vascular endothelial growth factor (VEGF), soluble fms-like tyrosine kinase 1 (sFlt-1), phosphatidylinositol-glycan biosynthesis class F (PIGF), vasopressin, nitric oxide, prostacyclin, endothelin-1, angiotensin-II, tumor necrosis factor alpha (TNF-alpha), Interleukin-4, Interleukin-6, Interleukin-10, and Interleukin-17.

We hypothesize that in early pregnancy utilization of blood-based biomarkers will improve clinical outcomes for those in rural West Virginia. The first step in utilization of these biomarkers is a pilot study examining baseline characteristics for our rural population.

### **Rural Resilience: A Healthier West Virginia. Interactive preventive healthcare modules for rural high school students.**

William Snider, MS2, Benjamin Clark, MS2, Andy White, MS2, Clay Willis, MS2, Payton Fitchpatrick, MS2

*Mentor:* Hillary Porter, DO

This study focuses on designing and delivering interactive preventive healthcare modules for rural high school students, with the goal of creating a healthier West Virginia. The modules will focus on the topics of Substance Abuse, Physical Activity/Obesity, Adult Education, and Mental Health Services. The study will measure awareness of these topics, current knowledge of the topics, and their comfort levels with discussing these topics with healthcare professionals in the future. Our study employs pre-and-post assessments to measure students' current awareness, comfort levels, and knowledge of preventive healthcare choices.

Student testimonials are integrated to enrich the learning experience, and free mentorship opportunities are offered to high school students. Moreover, this study establishes a framework for medical students to sustain these modules and extend their impact on rural healthcare education. This continuity enables the measurement of preventive healthcare outcomes in collaboration with Coalfield Healthcare, emphasizing a holistic approach to rural health education and promotion. The results of this study contribute to a deeper understanding of the effectiveness of interactive rural healthcare education modules in empowering students and promoting preventive healthcare in rural communities.

### **Incidence of Cleft Palate/Lip and Post-operative Outcomes After Repair: A Rural Appalachian Review. This is limited data in WV on the incidence of this disease, especially in rural areas.**

Mathew Dudich, MS3, Armein Rahimpour, PGY3

*Mentor:* Rahmin Berry, MD

The cleft palate and lip are amongst the most common types of innate Craniofacial anomaly. If left untreated or undiagnosed, many dire consequences result including but not limited to issues with feeding, teeth development, speech, socialization, and cognition. This anomaly is very treatable. Depending on the type and severity, different surgical and non-surgical techniques can be used.

**Breast augmentation Patient Satisfaction in an Appalachian Region. Improve the preoperative education of patients, including information on the most common complications.**

Samuel Suite, MS3, Armein Rahimpour, PGY3

*Mentor:* Rahmin Berry, MD

Breast augmentation as a cosmetic procedure is one of the most common surgeries performed by plastic surgeons. For elective cases and cosmesis, it would be dire to have a complication not covered thoroughly in the patient education process. outline specific steps that can be taken during the patient consultation and during surgery to decrease complications and improve overall patient satisfaction and patient outcomes, whether the patient is from a rural or urban community.

**Developing the future scientists, healthcare professionals, and leaders of Appalachia through neuroscience.**

Dami Adeshina, MS2

*Mentor:* Paul Ferguson, MD

Many students in rural Appalachia, specifically Wayne County, West Virginia, are interested in the neurosciences and medicine but lack the resources or exposure to discover their passion. According to the United States Census Bureau, Wayne County's bachelor's degree attainment rate from 2018 to 2022 stands at 18.3%, nearly half the national average of 34.3%. Additionally, Wayne County's percentage of individuals with disabilities under 65 years old, at 17.6%, is nearly double the national average of 8.9%, highlighting both educational and healthcare needs. This project explores how a virtual neuroscience program impacts the interests, understanding, and career aspirations of junior and senior high school students in rural Appalachia, Wayne County, WV. The one-week program includes daily lectures and a hands-on sheep brain dissection. Impact assessment will involve pre- and post-surveys and interviews.

**Rural Pediatric Wellness Initiative: An Educational Approach to Healthy Living**

Sarah Eaglen, MS2, Darshan Sangani, MS2, Sidney Strause, MS2, Ali Chapman, Nic Frazier, Nicole Liang, Brooklyn Johnson, Thomas Nixon, Jacob Wriston

*Mentor:* Adam Franks, MD

Our Rural Pediatric Wellness Initiative seeks to address the pressing need for improved pediatric health literacy among children in rural West Virginia. This study aims to enhance students' quality of life and promote holistic wellbeing through a comprehensive educational program that focuses on exercise, nutrition, hygiene, sleep, and dental health within Logan County, West Virginia. Over the course of six weeks, enrichment activities on these topics will be given to cohorts of elementary school aged participants of Energy Express, a summer reading and nutrition program for children in first through sixth grades living in West Virginia's rural and low-income communities. The enrichment will include short, interactive didactics, physical fitness challenges, and games all of which are age appropriate and theme coordinated. Data of baseline and improvements in health literacy understanding and habits will be collected by both weekly tracking charts and pre-/post-study data collection in a mixed-methods approach. The primary goal is to observe individual and group improvements, reflecting enhanced understanding as well as adoption of healthier habits. By fostering awareness and cultivating long-lasting positive behaviors, this project endeavors to begin to make a meaningful impact on the pediatric population of rural West Virginia. If successful, we hope to utilize the lessons learned from this project to create a larger project that could contribute to the creation of healthier communities for the future.