

RURAL RESEARCH PROJECTS 2013-2014

Project: *CHF- Cutting Hospital admission Frequencies*

Students/Residents: Becca Hayes, MS4, John Isaak, MD, PGY3, George Yousef, MD, PGY2, Christopher Fine, MS4

Mentor: Christine Gilkerson, MD

The goal of this pilot study is to develop an iPhone application for patients with congestive heart failure, specifically one that is simple and accessible to rural communities. The app will contain 4 elements:

1. An educational component to inform the patient about CHF
2. Daily reminders for medications and weight checks to increase compliance
3. A log to track their daily weights and blood pressures
4. A communication component that will allow the patient to text our research staff physicians any non-emergent questions they may have. This will be HIPAA secure and designed to resend texts if the patient does not happen to have service at that initial time.

This project will site test the application upon its completion in January to be sure that it works well in rural areas (Wayne, Lincoln and Logan counties) with limited service. The students and residents will also be getting feedback from physicians and patients in these areas to help design the product for their use. The goal is to increase access to health care in these areas through technology that is functional in rural settings.

Project: *Risk factors for Cardiovascular Diseases in Rural Appalachian Women*

Fellow: David Francke, MD

Mentor: Ellen Thompson, MD

The objective of this study is to develop a prospective database of cardiovascular risk factors in rural Appalachian women. The Fellow and Mentor plan to work in conjunction with the Department of Obstetrics and Gynecology to build a robust unified database of rural women and cardiovascular risk factors, with the potential of expanding to a larger WV population. This database will be used to inform healthcare providers about the unique characteristic of our population, and how to focus our efforts on improving health in West Virginia. The researchers hope to make this a long-term project, with the involvement of medical students, residents, and fellows. It is also a potential way to expose learners at multiple levels at Marshall University to fundamentals of epidemiology and disease prevention.

The epidemic of cardiovascular diseases in West Virginia is becoming more and more recognized. Cardiovascular disease is the top killer in both the US and West Virginia. West Virginia ranks steadily above the national average for the various risk factors for the development of cardiovascular disease. Moreover, the American Heart and American Stroke Associations identify the incidence of heart disease to be concentrated in the southwestern region of the state. The project's main goal is to better identify the risk factors for heart disease in this region and devise means by which we can evaluate a cardiovascular profile to ultimately identify and reduce the long-term risk for cardiovascular disease in rural Appalachian women.

The project will use the Cardiology Outreach clinic in Logan, WV as the primary enrollment site, with potential to expand to other local providers. The clinic sees between 15 and 30 patients weekly. It has been in operation since 2003 and is established in the area. This practice will have a unique multigenerational population of women who tend to stay located in rural WV that will allow for long term follow-up of health outcomes.

Project: *Exploring Inter-Hospital Acute Care Transfers from Rural Hospitals*

Student/Resident: Artina Lane, MD, PGY2, Freddie Vaughn, MS4, Kate Rector, MS4

Mentor: Dilip Nair, MD

Considering the limited resources at rural hospitals, patient transfers from rural hospitals to larger, urban hospitals are inevitable. However, these transfers place financial burden on the healthcare system as well as financial and logistical strain on the patient and family. Results from a retrospective, descriptive chart review that looked at the reasons for and nature of inter-hospital transfers from rural hospitals in the tri-state area of West Virginia, Ohio and Kentucky raised questions concerning the nature and characteristics of the transfers. Notably, 10% of transfers did not obtain the specialty for which they were transferred, 25% were transferred for services that were available at the transferring facility, and approximately 25% had different discharge diagnosis than the receiving hospital. Additionally, there were some demographic patterns observed. The results from this study helped guide the current proposed research: to describe and analyze acute-care, non-obstetric, non-pediatric patient inter-hospital transfers from rural hospitals in West Virginia as well as explore the transferring physician's decision-making process. The method will be a chart review, at participating hospitals, of patient transfers compared to patients with same diagnosis who were not transferred. Interviews will be done with physicians who are involved in the decision making process to determine factors that contribute to their decision to transfer patients for acute care at another facility. The investigators hope to gain experience and insight for residents and students who may have interest in rural health in West Virginia. Additionally, we hope this will provide information that may guide any needed support for rural health physicians.

Project: *Evaluation of risk factors during pregnancy for long term cardiovascular disease in the female rural Appalachian population*

Resident: Melissa Rowe, MD, PGY1

Mentor: Ryan Stone, MD, David Chaffin, MD, Anne Silvas, PhD

The proposal is to establish a program to collect clinical data for the obstetric rural population in WV to better understand the link between pre-eclampsia (PE) and long term risk for cardiovascular disease (CVD). The data obtained will allow for elucidation of modifiable risk factors during pregnancy that can impact the risk of CVD later in life.

CVD remains the top killer in both the US and West Virginia. West Virginia ranks steadily above the national average for various risk factors contributing to the development of CVD. The southwest region of West Virginia has a concentrated incidence of CVD. PE has been identified and treatment with a therapy that could attenuate this disease later in life. Early identification and

treatment with a therapy that could attenuate this disease would make an impact in these rural areas where PE is thought to be much more prevalent than the national average for this disorder.

Other disease processes and life style choices contribute to CVD for women in rural Appalachia. Our ultimate goal is to devise a means by which we can evaluate a cardiovascular profile on these women. Using the unique “stress test” of pregnancy as a window to the future health of women in Appalachia, we can identify modifiable risk factors early in life that may provide a means to reduce some of their long-term risk for CVD. To achieve our objective we intend to build an infrastructure with personnel and equipment by which we can evaluate the CVD risk factors in women residing in our tri-state area. Post-graduates from Marshall University will be recruited to assist with the CVD profile. Computers with secure software will be used to record data from these profiles. Data can then be used to identify correlations between health during pregnancy and later development of CVD.

This pilot project will allow the establishment of the aforementioned database from our unique female population in rural Appalachia that is expounded upon in a prospective manner. Post-graduate student involvement in our rural communities will help increase awareness of the increased risk in this obstetric population. Future studies that utilize this data will help us improve the standard of care for these women.

Project: *Food environment, food security and obesity in a low-income West Virginia population*

Student: Lauren Burgunder, MS1

Mentor: Isabel Pino, MD

The overall purpose of this study is to determine if quality of household food is associated with food security and obesity in low-income rural Appalachian households with school aged children. Specifically, we will elucidate whether or not food security affects quality of food found in a household and the associated household rates of obesity in Appalachian families with a particular emphasis on childhood obesity. This question will be addressed with four approaches. First, using surveys administered to parents or primary caregivers, the study will measure food security, demographic data and height and weight in both rural and urban populations for comparative purposes. Second, parents or primary caregivers will complete an in-home food inventory to assess quality of food found in the home. Third, children of those parents who were surveyed will also have their height and weight measured. Fourth, the study will compare the rural population to the urban population. The study aims to illuminate associations between socioeconomics, obesity, food quality, and food security and identify possible sites of intervention.

Project: *Effect of Anecdotal Evidence on Teen Perception of Texting and Driving*

Fellow: Timothy Wilson-Byrne, MD

Mentor: Franklin Shuler, MD, Tracy LeGrow, PsyD

The **objective** of this research protocol is to quantify whether personal narratives and graphic evidence from motor vehicle collisions (MVC) caused by teen texting while driving can alter risk and behavior perception over simple verbal warning reminders.

Key points for Teen Texting and Driving epidemic are as follows:

- West Virginia is the second most rural state in the country with 64% of the population living in communities of less than 2,500 people;
- WV ranks 8th out of 50 states according to the CDC in Motor vehicle related death rates, 19.8/100,000, or about 359 deaths each year;
- The National Highway Traffic Safety Administration an estimated 1.6 million car crashes annually are attributed to Texting While Driving (TWD) of which teenagers represent an disproportionate number of those accidents.

Texting While driving has emerged as a significant risky behavior among teens in the US. This project is designed to alter perception and behavior of teen drivers with regards to Texting While Driving (TWD). Rural high school students are identified and given a short lecture from a victim involved in a TWD motor vehicle accident. Using a 20 question/ five minute survey we assess the effects of anecdotal narrative on teen behavior and perception immediately after and three months from the time of the presentation.

Outcomes of changes in perception, knowledge of WV law, risk of drunk driving vs. text driving, final attitudes towards texting and driving will be tabulated.