

RURAL GRANTS 2015-2016

Brain Games for the Pregnancy Brain

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Mentor: Adam Franks, MD

The effects of pregnancy on memory have been studied but the evidence is limited, while the research in underserved populations and rural populations is non-existent. We propose to study the improvement, stability or worsening of working and perceptive memory in pregnant and non-pregnant women with the use of cognitive enhancement software, Lumosity, opposed to pregnant and non-pregnant control subjects. Subjects will be randomly selected from the Marshall Health Family Medicine office in Lavalette and Lincoln Primary Care Center in Hamlin. Working memory will be assessed by means of standardized verbal and visual spatial skills utilizing Tatoon, a Java based software, while perceived memory will be evaluated using a Likert scale. Our study will be composed of four groups of women within the age range of 18-39. Each group will contain 15 subjects. Group A will consist of pregnant subjects who will use Lumosity for fifteen minutes three times per week. Group B will contain pregnant subjects who do not use Lumosity. Group C will be comprised of age matched non-pregnant subjects who will use Lumosity fifteen minutes three times per week. Finally, Group D will include age matched non-pregnant female subjects who do not participate in Lumosity. Pregnant patients will be randomized into either Group A or B, with non-pregnant patients stratified into Group C or D by matching education level. Memory will be evaluated a total of 4 times in each subject group – in every trimester of the pregnant participant groups followed by a post-partum survey and every three months in the non-pregnant participant groups. The initial visit will also include a demographic survey, and each follow-up visit will include a questionnaire to assess if there have been any significant changes in the patient's new social or medical stresses. Participants will be financially compensated for their participation in the study. Stipend will begin at \$10 for the initial visit and increase by five dollars for every subsequent visit with the total not exceeding \$70. Additionally, groups who did not receive access to Lumosity during the study will receive a one-year subscription to the program at project conclusion.

The Use of Telemedicine to Decrease Teen Pregnancy and School Dropout Rates in Rural McDowell County, West Virginia

Rachael Starcher, MS2 and Keegan Mullins, MS2

Mentors: Jennie Yoost, MD and Brian Dunlap, MD

This project involves teaching reproductive health and life skills to male and female high school students in McDowell County, West Virginia using telemedicine technology. This is an expansion of a previously successful project involving only female students. McDowell County is a rural county plagued by poverty, high teen pregnancy and increased school dropout rates. Telemedicine is an innovative technology that allows medical and educational services to reach areas where individuals with this expertise may not be

available; a technology especially useful for rural underserved communities. Telemedicine sessions will be incorporated into existing afterschool programs within two McDowell County high schools. Each session will cover either a reproductive health or life skill topic. Reproductive health subjects include male and female anatomy, physiology of reproduction, contraception and abstinence, sexually transmitted disease prevention, vaccinations, menstruation, and other specific teenage health concerns. Life skill topics include diet and exercise, sleep, mental health and stress management, relationship health, and self-esteem. Each topic will be discussed by Marshall University medical students under the mentorship of physicians with expertise in adolescent healthcare. The primary outcomes of this project are knowledge scores of reproductive health topics, measures of behavioral self-efficacy, and acceptance of telemedicine education. Long term outcomes are teen pregnancy rate and school dropout rate at yearly intervals following the educational intervention. Comparison populations from surrounding rural counties not receiving the telemedicine intervention will be used as a control group.

Opioid Compliance Program through a Local Health Department

Lonnie Berry, MS4

Mentor: Kevin McCann, MD

We intend to deploy a novel program using the local health department of a rural WV county. This program will be called the Opioid Compliance Program through a Local Health Department. To the best of our knowledge this type of program has not been implemented through a local health department. We intend to measure the impact of this program by monitoring the financial sustainability, the degree of improvement in quality of care, and the degree of burden relief provided to local primary care providers. This program and the data it generates will touch the following key areas: prescription drug abuse, physician burnout, and sustaining rural local health departments.

The Wayne county health department will use its nursing staff to provide a brief nursing visit with patients referred by their primary care provider for opioid compliance and diversion monitoring. The treating physician will determine how often they want their patient to report for assessment. The nursing encounter will include a urine drug screen, pill count, and CSAPP Review. An assessment note including the results of the urine drug screen, the pill count, and a copy of the CSAPP review will be sent to the referring physician.

Validation of Pediatric Fitness Test

Rebecca Hayes, MD, PGY-2

Mentor: Susan Flesher, MD and Terry Shepherd, PhD

Current research shows that 31.8% of youth in the United States are overweight or obese. Impressively, while 22.8% of 2-5 year olds meet the criteria, this number jumps to 34.2% of 6-11 year olds. Studies have also shown that decreased aerobic fitness is negatively associated with body composition in children. Therefore, focusing on assessing and increasing fitness in young children ages 5-10 is warranted.

The PACER (Progressive Aerobic Cardiovascular Endurance Run) is a validated measurement of aerobic fitness in children, however is only validated in children ages 10 and above. There is no validated measurement for children younger than 10 years of age.

West Virginia is consistently one of the most obese states in the nation. Consequently, we are also burdened with many of the diseases attributed to obesity, particularly cardiovascular disease. Intervening early is important for our state as the literature shows that poor cardiorespiratory fitness (associated with elevated body mass index) is associated with cardiovascular risk factors. There is currently a critical barrier to progress in addressing fitness in children aged 5-10 years, because there is no valid tool to measure fitness in the age group. This study will develop a novel step test to serve as a simple and inexpensive method of monitoring fitness in these young children.

Assessing Gender Bias in the Evaluation of Chest Pain: Is There a Difference in the Rural Setting?

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Mentor: Paulette Wehner, MD, Mitch Charles, MD, and Henderson McGinnis, MD

Coronary heart disease is the largest single cause of death in West Virginia for both men and women. While small rural emergency facilities play an important part of emergency cardiac care, little is known about how women are interviewed, examined, tested and treated for chest pain in rural emergency departments in contrast to a university affiliated teaching hospital. Heart disease and stroke account for 29.7% of all female deaths in West Virginia. On average, nearly 9 women die from heart disease and stroke in West Virginia each day.

Diagnosis is also complicated in that cardiac conditions often present very differently in women than in men. Too often, women do not recognize that they are experiencing a cardiac event, making it less likely for them to seek medical help. This delay in health care can lead to higher rates of complications and death. Studies on myocardial infarction involving women indicate a higher incidence of “atypical” symptoms and a longer duration of pain before presentation. These differences may lead to delayed diagnosis and treatment in women. Although women have a higher morbidity, mortality, and recurrence rate in coronary artery disease, several studies also indicate a less elaborate treatment of women (e.g., fewer women with positive noninvasive tests undergo cardiac catheterization and coronary artery bypass surgery or coronary angioplasty).

This study will be a review of patients who presented with new-onset, non-traumatic chest pain to evaluate gender bias in the diagnostic and therapeutic approach during a six-month period at a rural hospital emergency department and contrast the approach findings to a university affiliated teaching hospital. To strengthen the affiliation with the Point Pleasant area, residents and medical students will be involved in organizing, promoting and participating in two community-based services associated with this study:

- 1) Physician Educational Intervention
- 2) Patient Cardiac Educational Awareness Session

Evaluating Cardiovascular Health in a Rural West Virginia with High Risk of Cardiovascular Disease

Justin Pacor, MS2

Mentor: Robert Touchon, MD, MPH

In 2009, the American Heart Association (AHA) drafted the 2020 Impact Goal, which aims to improve the cardiovascular health of all Americans by 20 percent, while reducing deaths from cardiovascular diseases and stroke by 20 percent, all by the year 2020. In order to accurately measure Americans' cardiovascular health and monitor progress towards the 2020 goal, the AHA defined the concept of "Ideal Cardiovascular Health," according to 7 health behaviors and factors. These metrics, deemed "Life's Simple 7" (LS7), include smoking status, body mass index (BMI), physical activity, diet, total cholesterol, blood pressure and fasting blood glucose. For each metric, the AHA defined specific criteria for poor, intermediate, and ideal, with a goal of increasing the prevalence of ideal metrics within the population.

The goal of this project would be to objectively identify, via a well-established predictor of cardiovascular health, namely the Ankle-Brachial Index, a group of asymptomatic individuals at risk of cardiovascular disease. In this at risk group, we would determine baseline cardiovascular health, as defined by the AHA, and employ an intervention that included education on the metrics that make up LS7, means to regularly record their progress on each metric, including but not limited to pedometers to measure physical activity, and prescriptions of medically appropriate cholesterol and blood-pressure lowering medications. The primary goal would be to compare compliance in this group to an age-gender matched group of asymptomatic individuals without an objective measurement of vascular disease.

Teen Pregnancy and Availability of Long Acting Contraceptives in Rural Areas

Pooja Sangani, MS3

Mentor: Jennie Yoost, MD

Nationwide teen pregnancies have continued to decrease over the past several years, which correlates to an increase in the use of long acting reversible contraceptive (LARC) methods. These methods, either the intrauterine device (IUD) or subdermal implant, have much higher efficacy than other contraceptive methods, such as birth control pills. These methods are recommended first line for adolescent use, yet require provider training to perform these services. Family planning clinics are available throughout the state of WV and provide contraception, however not all clinics provide LARC services. In many rural counties in WV, teen pregnancy remains high and relatively unchanged. This may be a reflection of accessibility to effective contraception. This study evaluates the availability of LARC methods in individual counties in WV and correlates the number of available LARC providers to teen pregnancy rates. This study will also evaluate other barriers to adolescent access to these services, such as provider comfort in using these methods in young adolescent patients. It is our hypothesis that rural areas will have less access to providers trained in these effective methods, and that trained providers in rural areas may be less comfortable in providing these services to younger adolescents.