THEME I - REDUCTION OF BEHAVIORALLY-BASED CANCER RISK

<u>Approach/emphasis</u>: The CCPH has formed a tobacco science research group led by Stephen Branstetter, Ph.D. CCPH Research activities include various levels from community prevention and intervention to gene-environment interactions and nicotine in mouse models. CCPH members with nicotine and tobacco interests spans numerous colleges and departments, and include the Prevention Research Center and the Methodology Center. The following is a listing and categorization of CCPH faculty conducting research in the area of cigarette smoking, tobacco or nicotine.

Major topics/research aims include:

- a) Developing and testing cognitive and social strategies to reduce tobacco uptake in adolescents and young adults at risk for developing nicotine dependence;
- b) Evaluating the efficacy of alternative nicotine products and devices in promoting and sustaining cessation of tobacco use.
- c) Test and evaluate smoking cessation strategies for rural and disadvantaged populations in Central PA.

THEME I - INVESTIGATORS

Community / Public Health / Prevention / Intervention / Policy

- Gary King, Ph.D. Biobehavioral Health.
 - Smoking epidemiology research and comparative analyses
 - o African American smoking behavior
 - Stephen A. Branstetter, Ph. D. Biobehavioral Health
 - Youth smoking behaviors
 - o Youth smoking cessation and intervention
 - o Genetic expression and smoking behaviors
 - o Cancer patients and smoking
- Mark Greenberg, Ph.D., et al. Prevention Research Center
 - School-based prevention
 - Emerging adulthood and risk behaviors
 - o Longitudinal research
 - o Epidemiology
- Jonathan Foulds, Ph.D. Public Health Sciences
 - Smoking cessation & relapse prevention interventions
 - Psychopharmacology of nicotine delivery products
 - o Assessment of nicotine withdrawal and dependence
 - o Epidemiology of different tobacco products

Clinical / Experimental / Behavioral

- Charles Geier, Ph.D. Human Development and Family Studies
 - o Decision making in adolescence and childhood
 - Cognitive control and risk behavior
 - o Behavioral and cognitive neuroscience
- Stephen Wilson, Ph.D. Psychology
 - o self-regulatory failures characteristic of addiction
 - Cognitive and social neurosciences
 - o fMRI imaging studies
- Stephanie Lanza, Ph.D. Methodology Center

- o Modern methods for causal inference
- o Intensive longitudinal data reveal dynamic processes, including substance use cessation.
- Linda Collins, Ph.D. Methodology Center
 - Applying statistical methods to address complex research questions in the behavioral, health, and social sciences.
 - Structural equation modeling,
 - o Measurement theory
 - Mixed effect model
- Laura Klein, Ph.D Biobehavioral Health
 - Nicotine regulation of stress reactivity
 - o Neuroendocrine and behavioral stress responses
 - o Biobehavioral effects of stress on nicotine in humans and animals

RESEARCH ACCOMPLISHMENTS

- Using Time to first cigarette (TTFC) measurement, Muscat et al have identified phenotypes of nicotine dependence (high dependence/ low dependence); their subsequent work identified and validated TTFC as risk factor smoking-related diseases.
- 2) Development and validation of the Nicotine Withdrawal Assessment for Youth instrument (N-WAY) Goldfine and **Branstetter** et al, 2012.
- 3) Wilson et al have reported use of functional brain imaging methods to advance understanding of the psychological mechanisms underlying relapse among persons trying to quit smoking (Wilson et al., 2012, Journal of Abnormal Psychology; Wilson et al., in press, Addictive Behaviors). They have identified clinically-relevant differences in the patterns of neural activity exhibited under "high risk" conditions (i.e., during the presentation of a smoking , as well as for tailoring interventions based upon individual smoker characteristics. The long-term aim is to use our laboratory findings to guide the development of approaches that can be integrated into existing contingency-based strategies for treating smoking in order to enhance their effectiveness.

KEY RECENT PUBLICATIONS RELEVANT TO THIS THEME (N=32; years 2010-2012) <u>Selected works:</u>

Oredein T & Foulds J. Causes of the decline in cigarette smoking among African-American youths from the 1970s to the 1990 Am J Public Health 2011 Oct;101(10)

Fagerström K, Russ C, Yu CR, Yuni C, Foulds J. The Fagerström Test for Nicotine Dependence as a predictor of smoking abstinence: a pooled analysis of varenicline clinical trial data. Nicotine and Tobacco Research 2012.

Branstetter S, Muscat j Time to First Cigarette and Serum Cotinine Levels in Adolescent Smokers: National Health and Nutrition Examination Survey, 2007-2010. Nicotine Tob Res. 2012 Sep 18.

Muscat JE, Ahn K, Richie J, Stellman SD. Nicotine dependence phenotype and lung cancer risk. Cancer. 2011 Dec 1;117(23):5370-6.

(High impact) Geier, C. F., Terwilliger, R., Teslovich, T., Velanova, K., and Luna, B. (2010). Immaturities in reward processing and its influence on inhibitory control in adolescence. Cereb Cortex *20*, 1613-1629. PMC28

(High impact) Catalano, R. F., Fagan, A. A., Gavin, L. E., Greenberg, M. T., Irwin, C. E., Jr., Ross, D. A., and Shek, D. T. (2012). Worldwide application of prevention science in adolescent health. Lancet *379*, 1653-1664.

THEME II - REDUCING CANCER DISPARITIES THROUGH OPTIMAL USE OF HEALTH SERVICES IN COMMUNITIES

Approach/emphasis: Established focus on patterns of care for breast, colorectal and skin cancers care including screening and treatment. In its 1999 report *Ensuring the Quality of Cancer Care*, the National Cancer Policy Board of the Institute of Medicine recommended more emphasis on gathering evidence to support the provision of high-quality cancer care. Although the course of treatment is predominantly dictated by clinical characteristics of the tumor (such as stage, size, and receptor status), all providers are not equally well equipped to treat high-risk cancer patients. Thus, the likelihood of receiving optimal treatment for cancer may partly depend on such measurable characteristics of heath care providers and systems as volume, accreditation, and care coordination services. Within rural areas such as Appalachia, there is considerable variation in the local supply of oncology care. Some patients in this region have no nearby oncology services; others have easy access to small, unaccredited hospital cancer programs and surgeons who treat a few cancer patients each year, but they would have to travel much farther to a large, accredited cancer center; still other patients live within a relatively short distance of sophisticated, high-volume facilities and cancer practices. In our current work we have demonstrated that quality of cancer care is closely linked to use of high-performing provider types.

Major topics/research aims include:

Current CCPH theme research emphases are:

- a) Distribution of late stage breast and colorectal tumors in Appalachia.
- b) Variations in care and outcomes for advanced stage or complex cases of breast and colorectal cancers.
- c) The role of screening/early detection breast and skin cancers;
- d) Access to surgery facilities or center in optimal care outcomes, and community contexts in patient access and outcomes.

THEME II - INVESTIGATORS

Health services research – access, cost and quality

Roger Anderson, Ph.D.

- o Patterns of care, breast cancer screening
- o Patient-centered outcomes
- o Cancer disparities
- Pam Short, Ph.D.
 - o Patterns of care, health utilization
 - Hospital typologies
 - o Network analysis
- Chris Hollenbeak
 - o SEER analysis , cost, utilization

Wenke Hwang, Ph.D.

- Care coordination
- o Medical homes and ACO
- o Cost

Use of specialized cancer services and treatment

Heath Mackley, M.D.

• Radiation oncology service use and outcomes

Niraj Gusani, M.D.

o GI surgery, complications and outcomes with advanced disease

Rob Turrisi, Ph.D.

• Skin cancer screening and patient education

Geospatial mapping and estimation

Stephen Matthews, Ph.D.

o Community health, demography, population health statistics

Community/ family health/patient needs

Gene Lengerich, VMD

Community health workers, outreach, cancer screening

Oralia Dominick, Ph.D.

o Health disparities, cancer screening

Elana Farace, Ph.D

• Patient outcomes, HRQL, caregiving supports

Michael Greene, M.D,

• Advanced care directives, caregiver supports

RESEARCH ACCOMPLISHMENTS

- Turrisi and colleagues have validated self-report measures of unprotected sun exposure (assessing frequency and use of protective clothing) based on diary reports, and allowing this risk behavior to be reliably assessed in research studies.
- 2) Lengerich and Yao using SEER data discovered that breast cancer mortality rates in Appalachia are declining at a much slower rate than the US in general, and that Appalachia now has higher mortality rates overall than the US for the first time since SEER data have been collected. Hypotheses for this trend have stimulated new research proposals focused on declines in breast cancer screening in older adults and due to poverty, poorer adherence with hormonal therapies, and less aggressive treatment for advanced complex tumors.
- 3) Lengerich and colleagues documented that limited financial resources for patient navigation have halted progress in improving cancer health outcomes in rural areas with a result of limited coordination of cancer services across health care and non-health care institutions. This team has also tested a theory-based primary care-based intervention to promote colorectal cancer screening in two studies of rural communities in Appalachia. Their intervention obtained an increase from 17% to 35%, and a conversion of 42% of non-compliant, unscreened patients to screened for colorectal cancer.
- 4) Anderson, Matthews and Lengerich found prior use of mammography in Appalachia was approximately 54% among Medicare enrolled women. On both individual and geographic levels of analyses, not having 2-year prior routine use of mammograms was strongly associated with later-stage tumor incidence compared to early stage tumors. On average, a 10 percent decrease in mammography screening rates was related to a 7.2 percent increase in the number of later

stage tumors diagnosed. Not having access to timely screening would result in an excess of 8.37 later-stage tumors out of 100 diagnosed cases attributable to lack of screening.

5) In Appalachia, we have found that disparities in use of facilities with accredited cancer programs were a major contributor to under-assessment of lymph nodes among rural colon cancer patients compared to urban patients. Equivalent use of larger, accredited cancer programs would erase the rural deficit in guideline concordance in the states we studied.

KEY RECENT PUBLICATIONS RELEVANT TO THIS THEME. (N=18; years 2010-2012)

Selected works

Kimmick GG, Camacho F, **Hwang W, Mackley H**, Stewart J, **Anderson RT**. Adjuvant Radiation and Outcomes After Breast Conserving Surgery in Publicly Insured Patients. J Geriatr Oncol. 2012 Apr 1;3(2):138-146.

Weaver KE, Camacho F, **Hwang W**, **Anderson R**, Kimmick G. Adherence to Adjuvant Hormonal Therapy and Its Relationship to Breast Cancer Recurrence and Survival Among Low-income Women. Am J Clin Oncol. 2012 Feb 6.

(High impact) McLaughlin JM, Anderson RT Ferketich AK, Seiber EE Balkrishnan R, Paskett ED. Effect on Survival of Longer Intervals Between Confirmed-diagnosis and Treatment Initiation among Low-income Women with Breast Cancer, (in press 2012); Journal of Clinical Oncology.