

**The Johns Hopkins University / National Human Genome  
Research Institute, National Institutes of Health  
Genetic Counseling Graduate Program**



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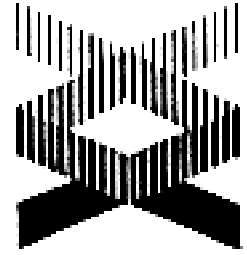
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**THESES SUMMARIES IN CHRONOLOGICAL ORDER**

*Class of 2019*

**1. Growth Attenuation Therapy: Experiences, Attitudes, And Practices Of Genetic Counselors**, Katherine Anderson, Advisor: Jill Owczarzak.

**Abstract:** Growth attenuation therapy (GAT) is a controversial intervention used to halt the growth of children with profound disability with the intention of facilitating long-term care by the child's guardians. There are no nationally accepted clinical guidelines to direct clinicians how and under what circumstances to initiate a referral for GAT, and clinician attitudes and practices regarding GAT are poorly understood. Pediatric genetic counselors often serve a role helping guardians make decisions about treatments and coordinating care for their child. In this study, genetic counselor attitudes and clinical behaviors regarding GAT were explored through a survey of 62 pediatric genetic counselors and semi-structured interviews with eight genetic counselors who had considered or discussed GAT for a patient. GAT is a divisive intervention for genetic counselors, and attitudes toward GAT diverged the most regarding the degree to which GAT infantilizes children and the extent to which choosing GAT for a profoundly disabled child infringes on that child's autonomy. Most genetic counselors felt some discomfort about discussing GAT with a family whether due to their limited knowledge of the intervention or their opposition to its use. However, participants also emphasized genetic counselors' unique skillset as a bridge between medical doctors and patients, and as a source of therapeutic counseling for guardians facing difficult care decisions which may be called upon in discussions of GAT.

**2. "It's Easy to Assume that They're Okay": Genetic Counselors' Willingness and Preparedness to Discuss the Interpersonal and Psychological Effects of Miscarriage**, Alexa Geltzeiler, Advisor: Bill Klein.

### **3. Racial and Ethnic Differences in Awareness of Genetic Testing in the U.S. Population: A Secondary Data Analysis Using the Health Information National Trends Surveys,** Yingyue (Annie) Li, Advisor: Lori Erby.

**Abstract:** Members of ethnic and racial minority communities report lower awareness of genetic tests than others (Pagan et al, 2009). Previous studies have examined predictors of testing awareness in cross sectional studies reflecting a single point in time consideration (Pagan et al., 2009; Roberts et al., 2019) with relatively attention to how racial and ethnic differences may have changed over time or the extent to which these differences might be accounted for by predictors other than race/ethnicity, such as health literacy.

The Health Information National Trends Survey (HINTS) periodically surveys members of the U.S. public and has captured information about participants' awareness of genetic tests. In the present study, utilizing the HINTS datasets from 2008 to 2017, we described racial and ethnic differences in genetic testing awareness over time.

Moreover, focusing on the 2017 HINTS via regression analysis, we also described that the population with low awareness is more likely to be older than 65 years of age (65 – 74 y.o.: OR=0.56, p=0.046; 75 y.o. and above: OR=0.37, p=0.0007), more likely to be born outside of the United States (OR=0.44, p=0.01), less likely to seek cancer-related information (OR=0.49, p<.0001), lower in health literacy (OR=1.46, p=0.012), and more likely to believe that there is not much that one can do to lower the chance of getting cancer (OR=1.97, p=0.049), while adjusting for education, gender, and family history of cancer.

We elucidated that with the adjustment of covariates, non-Hispanic black participants continued to be significantly less aware of genetic testing (OR=0.44, p=0.0018), comparing to non-Hispanic whites. However, differences in other racial and ethnic groups did not persist after accounting for the role of other identified characteristics.

These findings may inform policy-makers and clinical practitioners to leverage targeted strategies addressing racial and ethnic differences in genetic testing awareness as well as active strategies to improve access to care.

### **4. Genetic Counselors' Implicit Racial Bias And Cognitive, Emotional, And Informational Exchange In Simulated Sessions,** Chenery Lowe, Advisor: Debra Roter.

**Abstract:** Objectives: Implicit racial bias has been shown to negatively affect several communication processes (Schaa et al., 2015), suggesting that bias is detrimental to the genetic counselor-client relationship and therefore impedes progress toward client-centered goals. This study extends previous research in the domains of implicit bias and interpersonal communication to identify possible directions for communication training and practice intervention.

Methods: Secondary analysis of a nationally representative sample of genetic counseling sessions with white and minority (Black and Latino) simulated clients (SCs) was conducted. A subset of the genetic counselors (GCs, n=60) completed a Race Implicit Association Test (IAT). The Roter Interaction Analysis System (RIAS) was used to characterize and code GC and SC communication behaviors and Linguistic Inquiry Word Count (LIWC) was applied to session transcripts to analyze SC talk. Main outcomes were SC cognitive and emotional processing, GC facilitation of cognitive and emotional processing, and GC's provision of personalized clinical information. Multiple linear regression analyses were performed to relate these outcomes to GCs' IAT scores, SC race, and statistical interaction between GCs' IAT scores and SC race.

Results: GCs' implicit racial bias had different effects on GCs' provision of information depending on SC race ( $p < 0.05$ ). For minority SCs, higher (more pro-white) IAT scores were associated with GCs being less likely to provide personally-framed clinical information relative to white SCs. GCs ( $n=60$ ) used more cognitive facilitation strategies with minority than with white SCs ( $p=0.04$ ).

Conclusions: Genetic counseling communication may reflect differential processes of individuation and categorization based on client race. Clinical as well as interpersonal communication may be sensitive to the effects of GCs' implicit racial bias. The relationship between client race and cognitive, affective, and informational exchange in genetic counseling sessions is complex.

## **5. Adult Patients With Undiagnosed Conditions And Their Responses To Clinically Uncertain Results From Exome Sequencing, Ahna Neustadt, Advisor: Lori Erby.**

**Abstract:** Patients pursuing exome sequencing in their quest for diagnosis will most often receive a clinically uncertain result. A clinically uncertain result has some level of objective uncertainty as viewed by clinicians regarding a patient's diagnosis. A clinically uncertain result can be a result that is negative, with no reportable genetic variants, or that includes one or more genetic variants deemed uncertain with regard to the cause of a patient's condition. Clinically uncertain results present challenges to both providers and patients in disclosing and processing ambiguous health information. This exploratory study sought insight into the psychological and behavioral impact of receiving clinically uncertain results from exome sequencing. Semi-structured phone interviews were conducted with 23 adult patients with undiagnosed conditions who have received two of the more common types of clinically uncertain results from exome sequencing: either a negative result or a result with one or more variants of uncertain significance. Interviews focused on the experience of receiving the clinically uncertain result, with emphasis on conceptualization of uncertainty and coping. Interviews were transcribed and subjected to thematic analysis, and results were analyzed within the context of participants' diagnostic odysseys. No thematic differences were found between the experiences of those who received negative results versus those who received one or more variants of uncertain significance. Participants demonstrated a variety of conceptualizations of the uncertainty related to their exome sequencing result and undiagnosed condition. They were generally acclimated to illness uncertainty due to their lengthy and ongoing diagnostic journey, which resulted in realistic expectations about and acceptance of their clinically uncertain results. However, participants still hoped that exome sequencing would end their diagnostic odyssey, and many remain hopeful that future technological advances will provide them with a diagnosis. This residual hope, as well as optimism, were used as coping strategies to deal with continued uncertainty. Understanding how patients with undiagnosed conditions respond to clinically uncertain results from exome sequencing can inform providers' practices around informed consent and the disclosure of clinically uncertain results through a greater consideration of patients' reactions, concerns, and challenges with adaptation to uncertainty.

*Class of 2018*

**1. Effects of Communication Complexity on Analogue Clients in a Video Cancer Genetic Counseling Session**, Emily Bonkowski, Advisor: Lori Erby, Poster Presentation 2018 NSGC Annual Conference

**Abstract:** Objective: Communication of information plays a central role in genetic counseling. There have been few direct comparisons of differing communication approaches. This research study aimed to experimentally manipulate communication of genetic information and to describe how the complexity of counselor communication impacts client affective and cognitive outcomes using a hypothetical cancer genetic counseling scenario. Methods: The study used a mixed methods experimental design consisting of a web-based module that simulated specific educational and communication aspects of a cancer genetic counseling session. Female study participants (N=286) were randomly assigned to watch one of three simulated video genetic counselor sessions of either high, medium, or low communication complexity consisting of 8-21 minute of short video clips. Demographic information, personal perceived cancer risk, genetic literacy, and patient-provider orientation were collected before beginning the videos, and survey instruments were administered after the videos to capture decisional, affective, and cognitive outcomes. Results: Low complexity communication of information reduced feelings of negative emotion (including confusion) compared to the high complexity group. Individuals in the medium complexity group felt more decisional conflict than the high complexity group. No other main effects on measured genetic counseling outcomes were detected. Genetic literacy and patient-provider orientation had modifying effects on the relationship between complexity level and some outcomes. Personal characteristics, including age, race, perceived personal risk of cancer, genetic literacy, and patient-provider orientation were associated with some genetic counseling outcomes. Participants generally found the experience to be realistic. Conclusions: Low complexity communication did not elicit poorer outcomes than high complexity communication overall. Our findings also support the notion that personal factors influence clients' reactions to genetic counseling communication. In accordance with principles of patient-centered communication, it is important to tailor communication to fit clients' needs.

**2. Is It Feasible? Self-Affirmation for Hereditary Breast and Ovarian Cancer Genetic Counseling**, Anna Chassevent, Advisor: Barbara Biesecker, Poster Presentation 2018 NSGC Annual Conference

**Abstract:** Background: In recent years there has been increased understanding of the genetic factors that predispose people to cancer. While this increase in knowledge can improve patient health, patients, who are at increased risk for cancer, face decisions about testing, cancer screening, communication with family members, and even prophylactic surgery. Statement of problem: As more people face these decisions it is important for genetic counselors to support them in the decision-making process. Self-affirmation interventions may be an effective way to improve hereditary breast and ovarian cancer (HBOC) genetic counseling patient-centered outcomes. The study described is a randomized controlled trial to assess the feasibility of implementing a SA intervention in a cancer genetic counseling clinic. Methods: This study was conducted in a hereditary cancer clinic at St. Luke's Health System in Kansas City, Missouri. Patients who attended the clinic for a genetic counseling session, were randomized to completed a SA intervention or a control writing exercise beforehand and a survey of patient-

centered outcomes afterward. Counselors completed a patient empowerment assessment after each appointment. The primary feasibility outcomes were patient acceptance of the SA intervention, patient attrition, and the effectiveness of the SA intervention. Secondary outcomes were: decision self-efficacy, intentions to talk with family, genetic test uptake, patient empowerment, and HBOC knowledge. Results: All patient participants reported that the intervention did not interfere with their appointment (35/35). Coding analysis of patient essays showed that those who were in the intervention group were significantly more affirmed than those in the control group ( $p \leq 0.01$ ). None of the secondary outcomes were statistically significantly different between the control and intervention groups. Patient and counselor scores on the empowerment measure were not significantly correlated ( $p = 0.298$ ). Conclusions: Given our findings, follow-up studies, such as a phase II study is needed to enhance our understanding of SAs usefulness in buffering patients from the threat of cancer. Future studies should include more diverse populations and if SA is effective in the cancer setting, additional studies in other subspecialties of genetic counseling will be important prior to generalizing evidence across specialties.

### **3. Challenges to Informed Consent for Exome Sequencing: A Best Worst Scaling Experiment**, Rachel Gore, Advisor: Barbara Biesecker, Platform Presentation 2018 NSGC Annual Conference

**Abstract:** Background: As exome sequencing expands as a diagnostic tool, patients and providers have voiced concerns about the breadth and scope of potential results. Particularly, genetic counselors perceive challenges to prioritizing complex information during informed consent sessions. Objectives: This study first sought to characterize challenges to the informed consent process for exome sequencing. Secondly, it aimed to understand how genetic counselors prioritize elements of obtaining consent for clinical exome sequencing, and thirdly, whether counselor factors influence prioritization. Methods: Aim one was addressed through a systematic review of the published literature from January 2010 to February 2017. Seventeen identified challenges culled from the review informed the development of a best worst scale (BWS) used to address aim two. Eleven attributes for the BWS task were finalized with input from two focus groups and were assembled into choice sets using a balanced incomplete block design. A survey presenting the BWS tasks and assessing perceptions of communication and target efficacy and tolerance for ambiguity alongside demographics was assembled to address aim three. The survey was distributed to members of the National Society of Genetic Counselors via their email listserv. BWS data was analyzed using a counts based method, and stratified analyses were run with two-tailed t tests controlling for reported counselor factors. Results: 342 genetic counselors completed the survey. Counselors with more experience ordering exome sequencing were significantly more likely to work in pediatrics and reported higher communication and target efficacy. Ranking of best-worst scores revealed that genetic counselors prioritize collaborative decision-making, assessing patient understanding and managing expectations, with the least emphasis placed on discussing technological complexities. Stratified analyses found that counselors with more exome experience, and those who reported higher target efficacy, were significantly more likely to prioritize discussion of variants of uncertain significance ( $p < 0.05$ ). Discussion: Genetic counselors perceive challenges in addressing the many complicated aspects of exome sequencing, particularly secondary findings and limitations of testing. Counselors report intentions to prioritize aspects

of informed consent that focus on addressing individual patient needs. Additionally, participant characteristics influence discussion of potential uncertain results. Further research should explore how these priorities are exhibited in practice.

\*Manuscript in preparation

#### **4. Genetic Testing Preferences and Intentions in Patients with Clinically Diagnosed Familial Hypercholesterolemia**, Hannah Wand, Advisor: William Klein, Poster Presentation 2018 Annual Conference

**Abstract:** Purpose Familial Hypercholesterolemia (FH) is a common (1/250) Mendelian disorders that results in elevated LDL cholesterol levels from birth, and if left untreated can result in premature heart disease. Only up to 10% of affected individuals are clinically identified. This is problematic as early statin intervention reduces morbidity and mortality. Currently, there are no standard diagnostic criteria in the US. Genetic testing for FH is reportedly 80% sensitive (Brautbar et al., 2015) and could greatly improve diagnostic accuracy and management. Few patients in the US have a genetic diagnosis (Ahmad et al., 2016) and little is known about patients' reasons to pursue, or not pursue, FH genetic testing. The primary objective of this study is to identify predictors of FH genetic testing intentions in patients with a clinical FH diagnosis. Guided by the Health Belief Model and Theory of Planned Behavior, we predicted that high perceived benefits from and positive attitudes towards genetic testing would predict intentions to have testing; whereas high perceived risks or barriers would lower these intentions. Methods We recruited patients with a clinical diagnosis of FH who have not had genetic testing through the FH Foundation, in lipid clinics throughout the US, and at the FH Summit. Participants completed the survey online or on paper in person. We assessed attitudes, benefits, risks and barriers of genetic testing as potential predictors for testing intentions. Exploratory factor analysis collapsed items into factors that were used as independent variables in a linear regression with testing intention as the outcome. We controlled for age and gender and tested for interactions among factors. Results Exploratory factor analysis identified three factors: (1) aversion, (2) curiosity regarding medical/family history, (3) and psychological reassurance. Reassurance was the only significant predictor for genetic testing intention in our regression. There was a significant interaction between aversion and reassurance, such that aversion was inversely related to genetic testing intentions when there are low perceived psychological reassurance. Conclusions Our results suggest that genetic counseling around FH genetic testing should include discussion about the perceived psychological reassurances from genetic testing. This is important given that when perceived reassurances are low, those averse to learning genetic information would decline testing. Though it is always an option to decline testing, these decisions to decline would be worrisome if they are not informed decisions.

\*Manuscript submitted for publication

*Class of 2017*

**1. Understanding How Clients Make Meaning of Their Variants of Uncertain Significance in the Age of Multi-Gene Panel Testing for Cancer Susceptibility**, Devon Bonner, Advisor: Barbara Biesecker, Poster Presentation 2017 NSGC Annual Conference

**Abstract:** Background: Many clients who undergo genetic testing (GT) for cancer risk assessment receive variant of uncertain significance (VUS) result(s) whose association with cancer is unknown and lacks clinical utility. Clients' cognitive and affective perceptions (i.e. their interpretations) of uncertain genetic information often deviate from their memory of the information communicated by their genetic health care provider (GHP) (i.e. their recollections). This study describes clients' perceived uncertainties about their VUS result and differences between clients' recollections and interpretations of genetic risk information. Methods: Participants included adults with one or more VUS result(s) in a cancer susceptibility gene identified by GT. Participants completed a survey of quantitative scales measuring their perceived uncertainties about their GT result and their recollections, thoughts, and feelings about (1) the pathogenicity of their variant result; (2) their risk for developing cancer and (3) the likelihood that cancer is hereditary in their family. Summary statistics and bivariate analysis were used to describe the outcomes of interest. Results: Among the 68 participants, the majority were female (93%), Caucasian (97%), and college educated (59%). Most participants (82%) had multi-gene panel testing that identified one VUS (85%) on average 1.7 years  $\pm$  2.1 prior to study enrollment. Participants reported high perceptions of certainty about their GT result with a mean of 3.97  $\pm$  0.81 out of 5 and a median of 4.06. Although thirty-six participants (60%) recalled a VUS result, only 30 (50%) felt their variant was a VUS. Furthermore, many participants thought (35%) and felt (43%) differently about their variant's pathogenicity than their recollection. Compared to their recollection, participants perceived significantly higher cancer risks and hereditary likelihoods ( $p < 0.01$ ). Moreover, most participants ( $\geq 73.3\%$ ) reported that their GT result had influenced their risk perceptions. Conclusion: Regardless of their recollection, most participants perceived themselves and their families to be at greater risk for cancer suggesting false alarm. It is concerning that most clients do not seem to appreciate the inherent uncertainties about their result and that they are using their VUS result to inform their cancer risk perceptions. These findings have significant implications for what providers should address when conveying VUS results.

**2. Parental Decision Making for Fragile X Syndrome Clinical Trials**, Celeste D'Amanda, Advisor: Barbara Biesecker, Poster Presentation 2017 NSGC Annual Conference

**Abstract:** Background: There is a paucity of research evaluating parental proxy decision making for pediatric clinical trial participation. Fragile X Syndrome (FXS) is a rare genetic condition involving intellectual disability as its main symptom. Clinical trials have been offered and are under development. As intellectual disability directly affects an individual's personality, perceptions about trial participation and the potential for a disease-modifying therapy is likely different from the perceptions of parents raising a child with a physical disability or illness. Objective: To improve understanding of parental proxy decision making for clinical trial participation of children with intellectual disability. Methods: Interviews were conducted with parents from two groups: those who chose to 1) enroll their child with FXS in a trial; and 2) decline trial participation for their child with FXS. Parents were recruited through support groups. Interviews were transcribed and coded using thematic analysis. Results: The most prevalent contextual decisional factor was attitudes about FXS medications. The most frequent

trial-specific decisional factors were parental perceptions of the mechanism of the experimental drug, barriers and risks, and the match between parentally perceived purpose of the trial and their child's specific symptomatology. Parents' decision making processes involved weighing the risks and benefits of participation. Many parents reported making trial decisions primarily alone or with the support of their partner. All parents reported low decisional regret, though decisional conflict was found to range from low to high. Conclusions: The most prevalent, primary decisional factors synthesized by parents within their decision-making process were their strongly negative or positive attitudes towards medicating their child's FXS symptoms, excessive travel to trial site and high number of required appointments, and perceived risk of physical side effects. Potential for direct individual benefit from participation most directly shaped parents' trial expectations and hopes, providing ultimate motivation for participation and resulting in high therapeutic optimism amongst parents who elected trial participation. Our results offer insight into potential targets of downstream research evaluating interventions to facilitate these decisions and reduce undesirable decisional outcomes.

[D'Amanda CS, Peay HL, Wheeler AC, Turbitt E, Biesecker BB \(2019\) Fragile X syndrome clinical trials: exploring parental decision-making. \*J Intellect Disabil Res\* \(Epub ahead of print\).](#)

### **3. Where Culture Meets Genetics: Exploring Latinas' Casual Attributes of Breast and Colon Cancer and Mental Models of Disease Inheritance**, Katie Fiallos, Advisor: Lori Erby, Poster Presentation 2017 NSGC Annual Conference

**Abstract:** Purpose: To describe Latina immigrants' causal attributions of breast and colon cancer and explore this group's mental models of disease inheritance. Methods: A qualitative exploratory design comprised of freelist, ranking, and open-ended questions was used to interview 22 Latina immigrant women in Spanish. Participants were asked separately to freelist causes and risk factors for breast cancer and colon cancer. They were then asked to rank certain risk factors in terms of their role in the development of each cancer. SPSS v.21 was used to conduct cultural consensus analysis (CCA) on the rank orders to identify the presence of a cultural consensus model. Participants were asked semi-structured, open-ended questions regarding general disease inheritance. Interviews were transcribed and subjected to applied thematic analysis using Nvivo 11.3.2. Results: CCA showed no consensus surrounding rank of causes of either breast or colon cancer. "Genetics" and "hereditary factors" ranked first and second on average across participants for both cancers. These were the most salient factors in regard to breast cancer and the second and third most salient factors for colon cancer. Participants were less aware of colon cancer than breast cancer. Significant themes around risk factors included: the role of the psyche in causing cancer, the additive nature of risk factors, natural versus unnatural items, and ways to modify cancer risk. In discussing disease inheritance, participants often discussed the ability to modify a genetic predisposition and expressed uncertainty in their own genetic knowledge. Use of certain genetic terminology appeared to correlate with education level. Conclusions: Participants' causal attributions of breast and colon cancer were similar to those seen in the general public but different from the results of a similar study done 20 years ago with a more homogenous Latina immigrant population. Participants' beliefs about genetics and uncertainty about genetic knowledge were also similar to findings of other studies done in other populations. Healthcare providers need not provide Latina immigrant patients with different information on breast and colon cancer and



genetics than they would provide non-Hispanic white patients. Additional education about colon cancer is needed in this population as in the general public.

[Fiallos K, Owczarzak J, Bodurtha J, Beatriz Margarit S, Erby L \(2019\) Where culture meets genetics: Exploring Latina immigrants' lay beliefs of disease inheritance. \*Soc Sci Med\* \(Epub ahead of print\)](#)

**4. Likely Pathogenic, Possibly Pathogenic, or VUS: What's the Difference? An Experimental Approach to Assess Whether Individuals Discern Differences Between Uncertain Genetic Variant Classifications**, Lydia Hellwig, Advisor: William Klein, Poster Presentation 2017 NSGC Annual Conference

**Abstract:** Background: ACMG guidelines suggest that clinical laboratories use a variant classification system that includes five categories. Some laboratories use their own classification systems that divide variants of uncertain significance (VUS) into subcategories. There is little literature regarding patient perceived differences among the five ACMG categories of variants, and no literature on their perceptions of the subcategories of uncertain genetic test results. Objective: To determine whether patients perceive differences in different classifications of genetic variants, by measuring risk comprehension, risk perception, worry, perceived uncertainty, and behavioral intentions. Methods: Randomized hypothetical genetic test results were given to each participant enrolled in a genome sequencing study. Three categories of variants were presented to participants: Variant of Uncertain Significance (VUS), Variant- Possibly Pathogenic (VPP), and Variant- Likely Pathogenic (VLP). Results: A total of 291 participants completed the survey. Participants perceived risk to be higher if they received a VPP or VLP than a VUS, but did not perceive uncertainty differently for the variant categories. Behavioral intentions, including screening, sharing with family, seeking genetic counseling, and seeking specialty care were found to be higher for those who received a VPP as compared to those who received a VUS, but were not different between those who received a VPP and a VLP. Participants reported greater worry when they received a VPP than when they received a VUS. In addition, worry and risk perception were found to partially mediate the relationship between the variant classification received and behavioral intentions. Discussion: Our results suggest that sub-classification of uncertain genetic test results affects patient perception of risk, worry, and behavioral intentions, but not uncertainty. In addition, worry and risk perception partially mediate the relationship between genetic variant classification received and behavioral intentions. These findings are important in considering guidelines regarding classification systems and can help inform approaches to risk communication, which is an important component of genetic counseling.

[Hellwig LD, Biesecker BB, Lewis KL, Biesecker LG, James CA, Klein WMP \(2018\) Ability of patients to distinguish among cardiac genomic variant subclassifications. \*Circ Genom Precis Med\*. Jun;11\(6\).](#)

**5. Utilization of a Novel Web-Based Tool to Study Genetic Counselor Communication**, Michael Setzer, Advisor: Debra Roter

**Abstract:** Objective: Communication has been shown to be an important aspect of healthcare. This thesis aims to explore a new method of studying genetic counselor communication as well as further understand specific qualities of genetic counselor communication. Methods: A web-based client simulation was created for two client scenarios: prenatal amniocentesis and BRCA1 counseling. The web tool and an accompanying survey was sent to genetic counselors. Recordings were analyzed by Roter Interaction Analysis System (RIAS) as well as a content checklist. Results: Seventy two genetic counselors completed the post web-tool survey and 50 audible participant recordings were collected. RIAS and a content checklist was used to analyze twenty participant recordings. The majority of individuals found the tool easy to use and noted that the tool accurately reflected the information they give to real clients. Genetic counselors in the simulation primarily gave biomedical information. Discussion: This simulation method shows high degrees of technical feasibility, verisimilitude, and face validity. Genetic counselor communication varied in frequency of specific content as well as communication qualities.

\*Manuscript in preparation

*Class of 2016*

**1. Are genetic counselors screening for adolescent suicide risk?** Claire Anderson, Advisor: Lori Erby. Poster Presentation NSGC 2016.

**Abstract:**

Are genetic counselors screening for adolescent suicide risk? Suicide is a major public health issue and one of the leading causes of death for U.S. adolescents. As chronic illness is an additional risk factor for suicide, pediatric genetic counselors encounter particularly high-risk clients and are well-positioned to assess for suicide risk due to the psychosocial nature of their work. However, the suicide risk assessment practices of genetic counselors are largely unknown. This study seeks to describe the practices, attitudes, and beliefs of genetic counselors in relation to suicide risk assessment. Genetic counselors who have counseled adolescent clients were invited to participate in an anonymous online survey through the National Society of Genetic Counselors' Research listserv. The survey asked about genetic counselors' training, past experiences, attitudes, and beliefs about screening adolescent clients for suicide risk. Although recruitment is ongoing, 205 responses have been received. Preliminary analyses show that 45.6% (82/181) of participants reported having ever screened an adolescent client for suicidality. Furthermore, 23.2% (n=42) of participating genetic counselors were aware that they had previously counseled a suicidal adolescent client. Almost half (45.7%) of respondents had "not thought about assessing adolescent clients for suicide risk". Further analysis of the responses will include the identification of barriers and facilitators to suicide risk assessment in the genetic counseling setting. As these preliminary results suggest a need for genetic counselors to receive training in suicide risk assessment, final results could provide helpful guidance in how to best design such training.

**2. What Counts? The Role of Numeracy in Interpretation of Personalized Genomic Risk Information in Coriell Participants.** Kyle Davis, Advisor: William Klein, Poster Presentation 2016 NSGC Annual Education Conference.

## **Abstract**

Numeracy, one's preferences and skills with numbers, has an increasingly important role in genetics communication, as numbers are pervasive. The utility of personalized genetic medicine partly rests on people understanding and using risk information to make informed decisions about modifying behaviors or seeking preventive medical treatments. Although limited numeracy has been associated with poor understanding of numerical risk information generally, little is known about the relationship between numeracy and risk perception and genetics self-efficacy within the context of personalized genomic risks. This study partners with the Coriell Personalized Medicine Research Collaborative (CPMC), a long-term study exploring the utility of genetic information in clinical decision-making and health management by offering individualized, numerical risk assessments for common health conditions. This study will seek to explore the relationship between numeracy skills assessed with objective and subjective numeracy scales and risk perceptions and genetic self-efficacy. A 2x2 (high vs. low risk; intervention vs. no intervention) between-subjects vignette design will be used to administer a 43-question survey. The vignette describes an increased personal genetic risk of leukemia over the population risk (1.5RR vs. 2.5RR). The intervention is a short, written and pictographic explanation of the risk result and is compared with the current CPMC written and graphic format. ANOVA and multivariate modeling will be used to assess the main effect of numeracy on accuracy of leukemia risk and genetic self-efficacy. This study will explore these relationships and whether or not the intervention tool is superior to the current format in effectively communicating genetic risk information.

\*Manuscript in preparation

**3. Characterizing Personal Utility: A Systematic Literature Review.** Jennefer Kohler, Advisor: Barbara Biesecker, Oral Presentation NSGC 2015. Poster Presentation NSGC 2016.

**Abstract** With the advancement of sequencing technologies, genomic medicine is becoming increasingly integrated into clinical care. One result of this progress is that researchers and clinicians have recognized patient benefits of genomic testing results that are distinct from clinical benefits, termed "personal utility." Evidence of non-clinical benefits has been described in the literature inconsistently. Clearer understanding of the concept of personal utility will be important to evaluating the overall benefits of genome sequencing. The purpose of this study was to systematically review the literature to elucidate specific outcomes of genomic testing that comprise personal utility. An initial search returned 332 abstracts: 49 papers were read in full and 11 studies met inclusion/exclusion criteria. Studies were quantitative and qualitative in design and conducted on various types of genomic testing from single-gene disorders to wholeexome/ whole-genome sequencing. Meta-analysis of the study outcomes identified eighteen distinct concepts that fall into four domains: affective wellbeing, cognitive understanding, practical application, and social effects. Each concept was reported in an average of three of the eleven studies (mean: 2.78, mode: 6). The concepts expand on previously reported outcomes of genetic testing, to include spiritual wellbeing and change in identity, among others. The 18 concepts were used to inform a Delphi survey of participants in genome sequencing research to generate data toward consensus on the concepts defined by personal utility. The ultimate goal of these efforts is to generate a comprehensive definition of

personal utility that can be used consistently in the literature and future research assessing its impact.

Kohler JN, Turbitt E, Biesecker B

(2017) Personal utility in genomic testing: a systematic literature review. *Eur J Hum Genet.*

Epub ahead of print. <http://www.nature.com/ejhg/journal/vaop/ncurrent/full/ejhg201710a.html>

Kohler JN, Turbitt E, Lewis KL, Wilfond BS, Jamal L, Peay HL, Biesecker LG, Biesecker BB. (2017) Defining personal utility in genomics: A Delphi study. *Clin Genet.* Sep;92(3):290-297.

<https://www.ncbi.nlm.nih.gov/pubmed/28218387>

*Class of 2015.*

4. **Testing for hereditary cancer predisposition: The impact of the number of options and a provider recommendation on decision making outcomes.** Marci Barr, Advisor: Debra Roter. Oral presentation NSGC 2014-Best Student Abstract Award.

#### **Abstract**

Objective: To examine how the presentation of a decision can influence choices about genetic testing for inherited cancer predispositions. Specifically, how the number of options and the addition of a personalized recommendation might influence outcomes such as the likelihood of undergoing genetic testing, the genetic test chosen, and whether a person's test choice matches their personal preferences. Methods: An online hypothetical vignette study was completed by 454 healthy volunteers. Each participant was randomized to receive one of two survey versions which differed in the manner of presenting testing options and how these options were integrated with a provider recommendation. Regression analyses were performed to determine the relationships between the presentation of choice and participant decisions. Wilcoxon rank-sign tests were used to determine the impact of a provider recommendation on final genetic testing choices. Results: Participants were more likely to choose to undergo genetic testing when presented with three options instead of two (OR: 2.00 p=0.014). This effect was no longer observed when individuals who had decided not to undergo testing were presented with a third option (OR: 0.90 p=0.775). The addition of a provider recommendation did not significantly change the overall distribution of options chosen (p=0.746). However, after a recommendation, participants were more likely to choose the test that best matched with personal preferences about the type of genetic information desired (p<0.001). Conclusions: Participants are more likely to undergo genetic testing when presented with more options. They are also more likely to select an option in line with a personal preference if presented with a recommendation based on this preference.

5. **Where does hope fit in? The relationship between hope, uncertainty, and coping efficacy in mothers of children with Duchenne/Becker muscular dystrophy.** Megan Bell, Advisor: Holly Peay. Presented as Poster at NSGC 2016.

#### **Abstract**

Background: Duchenne and Becker Muscular Dystrophy (DBMD) is a complex, progressive, and ultimately terminal condition laden with caregiver uncertainty often related to prognosis, medical management, social, and existential concerns. This uncertainty can make adaptation more difficult for mothers, yet some view uncertainty as allowing for the opportunity of positive outcomes.

Literature suggests that the concept of hope may influence this appraisal of uncertainty. It is not yet fully understood how mothers of children with DBMD appraise, cope with, and ultimately adapt to their child's DBMD in light of this uncertainty or the role hope plays in the process.

Objective: To examine the relationships between maternal uncertainty, hope, and coping efficacy among mothers of children with DBMD.

Methods: Mothers of children with DBMD were recruited through the Duchenne Connect Registry, Parent Project Muscular Dystrophy, and Cincinnati's Children Hospital. A cross-sectional design with quantitative methodology was used to examine the relationships among maternal uncertainty, coping efficacy, hope, and other mother and child characteristics. Several open-ended questions were included to assess how mothers appraise uncertainty.

Results: The predominant focus of mothers' uncertainty was medical management and social support. Multivariate analysis revealed that older mothers' age, higher hope scores, and having less ambulatory children were significantly associated with less uncertainty. Mothers with lower hope scores, higher perceptions of uncertainty, and those reporting being less spiritual were less confident in their ability to cope with their child's DBMD.

Conclusions: Because younger mothers and those with ambulatory children with DBMD perceive more uncertainty, especially uncertainty related to medical management and social support, efforts to help mothers manage uncertainty may be more effective if tailored towards mothers of children with new diagnosis and specific domains of uncertainties most salient to them. Additionally, hope seems to be a factor in shaping uncertainty appraisals and facilitating coping efficacy. Although future studies are needed, interventions aimed at bolstering maternal hope or guiding mothers with low hope to other uncertainty management and reappraisal strategies may be helpful.

[Bell M, Biesecker BB, Bodurtha J, Peay HL \(2019\) Uncertainty, hope, and coping efficacy among mothers of children with Duchenne/Becker muscular dystrophy. \*Clin Genet\* \(Epub ahead of print\)](#)

6. **Physicians' experiences with and attitudes toward non-medical sex selection through preimplantation genetic diagnosis.** Nina Harkavy, Advisor: Lori Erby. Presented as poster at NSGC 2016.

#### **Abstract**

Background: Preimplantation genetic diagnosis (PGD) is an assisted reproductive technology (ART) by which embryos, created through in vitro fertilization (IVF), can be screened for genetic conditions or traits before they are implanted into a woman's uterus. Non-medical sex selection (NMSS) describes the use of PGD technology to choose the sex of a child for social, as opposed to medical, reasons. In the US and a select few other countries, it is legal to use NMSS for "family balancing," or the intentional selection of an underrepresented sex in a given family. Proponents of family balancing believe that NMSS is an expression of reproductive autonomy and is ethically acceptable on those grounds. Opponents are more likely to cite beneficence, nonmaleficence, and justice as the basis for concerns around NMSS and family balancing specifically. In the US and other countries, healthcare providers (HCPs) are often the gatekeepers to this technology. There is little research exploring the experiences of HCPs with PGD and NMSS. The Moral Experience framework (Hunt and Carnevale, 2011) is useful for understanding the potential concerns of HCPs as well as their feelings and behaviors evoked by lived and hypothetical experiences around NMSS. Objective: This study seeks to describe the experiences of healthcare providers around pre-implantation genetic diagnosis (PGD) for non-medical sex selection (NMSS), with a particular

focus on potential ethical concerns, their role in the decision-making process, and their views on future appropriate and inappropriate non-medical uses of PGD.

**Methods:** Semi-structured interviews were conducted with 8 OB/GYNs and 6 reproductive endocrinologists (REs) who are currently practicing in the US. Interviews focused on attitudes toward NMSS, implications of NMSS, decision-making, and non-medical trait selection (NMTS). The interviews were transcribed and subjected to thematic analysis using NVivo 9.0 qualitative software. **Results:** Findings from this study reveal the nuances of physicians' attitudes toward NMSS as well as the values that drive these attitudes. Analysis revealed that most physicians opposed NMSS but would support their patients because of the principle of autonomy. Autonomy was also often the cause of ethical dilemmas for physicians struggling to make a choice between two values. Interviews also showed that not all physicians identified as gatekeepers for NMSS technology. Physicians expressed conflicting preferences about the ideal decision-making process, but overall indicated that they wanted professional societies to make clear guidelines around NMSS. Lastly, physicians were mostly opposed to non-medical trait selection (NMTS) for reasons around interference in natural selection, parenting norms, and valuing differences among people. **Discussion:** Physicians are experiencing ethical dilemmas around NMSS and NMTS. This insight should be used to inform policy around NMSS and PGD.

## **7. Genetics researchers' perceived obligations to return incidental findings and individual research results to participants.** Cari Young, Advisor: Barbara Biesecker.

### **Abstract**

**Background:** Clinical investigators are increasingly facing decisions about returning individual research results (IRRs) and incidental findings (IFs) and from genome sequencing to research participants. Studies have shown that participants are interested in receiving results. Yet there has been debate in the bioethics community about the extent of researcher obligation to return both IRRs and IFs. Little research has focused on whether researchers perceive that they have an ethical obligation to return results, and whether such perceptions predict the return of results. **Objective:** This study examines researchers' perceptions about and predictors of their obligation to return results to participants. Further, we report on whether perceptions of obligations are concordant with reported practice. **Methods:** Human genetics researchers identified through the American Society of Human Genetics (ASHG) and the National Institutes of Health database of genotypes and phenotypes (dbGaP) were invited to complete an online survey conducted by the Genetics and Public Policy Center seeking to describe perspectives about current issues in genetics including consent, privacy protections, data sharing, and the return of individual research results. This study (a secondary data analysis) seeks to describe the extent of researchers' perceptions of legal and ethical obligation to return results, describe predictors of such attitudes, and describe factors related to the reported return of results to participants. **Results:** Genetics researchers varied in the extent of their perceived obligation to return IRRs and IFs to their participants. While the majority of researchers (68%, n=242) support returning IRRs or IFs to participants, less than half reported feeling an obligation to return results (IRRs: 44%, n=158; IFs: 44%, n=157). Multiple linear regression showed that the use of clinical samples was predictive of higher perceived obligation to return results ( $p < 0.01$ ), while work setting was also predictive of feelings of obligation ( $p < 0.05$ ). The majority of genetics researchers (60%) do not return any IFs or IRRs to their participants. Further multivariate analysis revealed that those with higher perceived obligation and those with more interaction with participants were more likely to return results ( $p < 0.01$ ). Among those who do not return results, there were many influences on their decisions

including lack of useful results generated as well as barriers associated with IRBs, consent constraints, and level of contact with participants. Conclusions: These results provide insights into how researchers are thinking about their ethical obligation to their participants, and suggest that the extent of this obligation and the level of interaction with participants are associated with the return of IRRs and IFs. In the current research climate with a paucity of overarching guidelines on the topic, research teams often determine actual practice. This research suggests that these decisions are informed in part by the amount of interaction researchers have with their participants and the amount of perceived obligation felt by researchers, which provides assistance in thinking about how future guidelines may be conceptualized.

*Class of 2014.*

8. **The role of uncertainty in coping efficacy: Experiences of parents of children with undiagnosed multiple congenital anomalies.** Ellen Macnamara, Advisor: Barbara Biesecker. Oral Presentation NHGRI Symposium December 2013. Poster presentation NSGC 2014

### **Abstract**

Background: Uncertainty pervades all aspects of illness and health care and is especially relevant for those individuals with rare and undiagnosed medical conditions. Research has demonstrated that uncertainty can be a significant source of psychological distress and may affect adaptation. This study explores the perceived uncertainty, accounting for personality traits, among parents of a child with an undiagnosed medical condition. Methods: A cross-sectional, mixed methods design was used to examine the relationships among perceptions of uncertainty, coping efficacy, and coping, accounting for personality traits (tolerance of uncertainty, resilience, and optimism). The study design was informed by Lazarus and Folkman's Transactional Model of Stress and Coping. Measures included a newly developed Parental Uncertainty of Children's Health Scale which examined parents' perceptions of uncertainty and the importance of resolving the uncertainty. Parents of children with undiagnosed medical conditions were recruited through online support and advocacy groups. All participants completed the survey electronically. Results: Among the 94 respondents, the majority were biological mothers (94%), Caucasian (94.7%), and married (76.6%). A slight majority of the children were female (57.6%) and were, on average, 8.0 years old. On average, parents perceived greater uncertainty than certainty about areas of their child's undiagnosed condition that are important to them. Multivariate analysis revealed that optimism predicted perceptions of uncertainty ( $p < 0.01$ ), and that perceptions of uncertainty, optimism and resilience predicted coping efficacy ( $p < 0.05$ ). Additionally, multivariate analysis showed that coping efficacy and resilience predicted problem-focused coping ( $p < 0.01$ ) while resilience and tolerance of uncertainty predicted emotion-focused coping ( $p < 0.05$ ). Analysis revealed that perceptions of uncertainty greatly influence appraisals of coping efficacy such that higher perceptions of uncertainty result in lower coping efficacy. Conclusion: This study suggests that parents of children with undiagnosed medical conditions perceive uncertainty related to social support and medical management, which they view as important to resolve. The findings also suggest that personality traits contribute to the type of coping strategies parents choose to employ. Finally, this study contributes to the broader understanding of perceptions of uncertainty and the impact of these perceptions for parents of children with undiagnosed medical conditions.

\*Manuscript in preparation

9. **Adaptation to living with a BRCA1/2 mutation in carriers and their partners.** Rachel Shapira, Advisor: Gillian Hooker. Poster presentation NSGC 2014

**Abstract**

Women who carry BRCA1/2 mutations have a significantly elevated risk for breast and ovarian cancer. While the genetic testing experience can be a major stressor in the lives of these women, it is only one of many to come. Following a positive result, many decisions must be made, particularly in regards to surveillance and risk-reducing surgery. Both screening and surgical options can cause distress and anxiety, not only for the carriers themselves, but for their intimate partners as well. There has been little exploration of potential positive impacts of living with a BRCA1/2 mutation, though some qualitative work, as well as research in similar populations indicates that there are positive aspects to be found. Currently, there is limited understanding of how these women adapt to living with genetic risk. Further, their partners' adaptation to living with this risk remains unexplored. Objective: This study seeks to understand the process of adaptation in unaffected BRCA1/2 positive women and their intimate partners. This is the first study to examine psychological adaption in individuals living with genetic risk for cancer, as well as the first dyadic-level study of BRCA1/2 carriers and their partners. Understanding the experiences of these couples may help identify areas for future intervention studies to improve adaptation in similar populations. Methods: Female BRCA1/2 carriers and their partners were invited to complete surveys designed to quantitatively explore the relationships between the appraisals and timing of risk-related stressors, dyadic coping, and the outcomes of adaptation and dyadic adjustment. Results: Of the many stressors examined, women who had undergone prophylactic bilateral mastectomy had significantly higher levels of adaptation than those who had not. Further, their partners had significantly higher adaptation as well. Among women who had not had prophylactic mastectomy, those with higher perceived risk scores were less adapted. In general, the participants had high levels of dyadic adjustment and dyadic coping, indicating good overall relationship quality. Conclusions: These results aid in the understanding of the experience of living with cancer risk and the factors related to adaption. The relatedness of carrier surgical status to partner adaptation points to the importance of including intimate partners in the genetic counseling and risk management decision-making processes of BRCA1/2 carriers. Further, these results provide direction for future study to further elucidate the relationship between PBM and adaptation.

R Shapira, E Turbitt, LH Erby, BB Biesecker, WMP Klein, GW Hooker (2018) Adaptation of couples living with a high risk of breast/ovarian cancer and the association with risk-reducing surgery. *Familial Cancer*, 17(4): 485-493.  
<https://link.springer.com/article/10.1007/s10689-017-0065-z>

*Class of 2013.*

10. **Living in Lynch Syndrome Limbo: Understanding the Meaning of Uncertain Genetic Test Results.** Ilana Solomon, Advisor: Lori Leonard, PhD. Poster presentation NSGC 2013.

**Abstract**

Background: In the field of cancer genetics, clinicians and patients have encountered challenges related to the management of Variants of Unknown Significance (VUS). A VUS presents a clinical interpretation challenge and also evokes new counseling dilemmas for the understanding and psychosocial impact of uncertain genetic test results. Uncertainty surrounding health risks, specifically ambiguous medical tests, can affect illness perceptions and lead to changes in the way



one interprets their risk and personal status to develop a disease. There is limited information about the ways in which people react to VUS and this study aims to understand the various implications of an uncertain genetic test under the domains of cognitive, affective and behavioral effects. Individuals who are at risk for Lynch syndrome might look to the genetic test to confirm a diagnosis and construct psychological and behavioral management strategies. Ambiguous results from genetic testing also have implications for asymptomatic and symptomatic relatives.

**Objective:** The purpose of this study is to describe the experience of individuals who have received a VUS as part of the genetic testing process. Through these descriptions, this exploratory study aims to seek insight into the psychological impact of receiving a VUS test result for one of the Lynch syndrome/Hereditary Nonpolyposis Colorectal Cancer (HNPCC) mismatch repair genes. Understanding the impact of receiving a VUS may identify areas for future intervention studies to minimize negative effects of these events. Additionally, these data may contribute to the formulation of guidelines surrounding the informed consent and disclosure of VUS for other diseases.

**Methods:** Semi-structured interviews were conducted with 20 adult individuals who received a VUS for Lynch syndrome mismatch repair genes between 3 months and 10 years earlier. Interviews focused on the disclosure process, understanding and perception of uncertainty associated with the result, as well as coping strategies and communication patterns over time. The interviews were transcribed and subjected to thematic analysis using NVivo 9.0 qualitative software.

**Results:** Findings from this study indicate that most individuals recall their result and perceive various types of uncertainty associated with their VUS. Most participants appraised their variant as a danger and implemented coping strategies to reduce the health threat of developing cancer. Analysis revealed that individuals felt the risk of treating their variant as benign was higher than acting as though it was pathogenic. Mobilizing strategies to reduce their risk included vigilant cancer surveillance, information seeking, notifying their relatives and changing their lifestyle through diet and exercise. Individuals without a personal cancer history were more likely to appraise their uncertainty as an opportunity for hope of reclassification. The majority of participants were unaware of the possibility of a VUS before they received their result and expected reclassification over time. Obstacles included worry about family members and decisions surrounding prophylactic surgeries.

**Conclusions:** These results provide insight into the ways healthcare providers can support patients who receive VUS for Lynch syndrome. Results also provide direction for future work that can further explicate the impact of receiving a VUS.

Solomon I, Harrington E, Hooker G, Erby L, Axilbund J, Hampel H, Semotiuk K, Blanco A, Klein WM, Giardiello F, Leonard L (2017) Lynch Syndrome Limbo: Patient understanding of variants of uncertain significance. *J Genet Couns* (Epub ahead of print)  
<https://www.ncbi.nlm.nih.gov/pubmed/28127677>

**11. Challenges of Living with Frontotemporal Dementia: Understanding the Perspective of the Affected Individual Through Blog Content Analysis.** Weiyi Mu, Advisor: Barbara Biesecker, PhD, MS 2013.

### **Abstract**

Frontotemporal dementia (FTD) is a neurodegenerative disease deteriorating the frontal and temporal cortices of the brain, causing language, behavior and personality changes. The majority of research on coping and adaptation to FTD has focused on caregiver stress and burden; the impact of an FTD diagnosis on the psychological well-being of the affected individual has not previously been described. The goal of this study is to explore early awareness and

conceptualization of the impact of FTD using blogs written by individuals affected with FTD and caregivers of persons with FTD. The findings will be used to inform a future interview study of affected individuals and caregivers. Online weblogs ("blogs") written by individuals affected with FTD provide a source of pilot data to further understanding of the early impact of the disease. We identified blogs written by individuals affected with FTD (n=8), and blogs written by unmatched spouse or child FTD caregivers (n=8). A content analysis was conducted using a codebook derived from Werezak and Stewart's Continuous Process of Adapting to Early-Stage Dementia (2009). The analysis was targeted to text addressing awareness of disease, the personal impact of FTD, and coping strategies. These blogs demonstrate that affected individuals (likely in the early stages of disease) can articulate awareness of cognitive, behavioral, and language symptoms of FTD. This is contrary to assumptions in the literature that persons with FTD have poor insight and limited awareness of their cognitive changes. Awareness of signs of dementia precipitated psychological distress related to challenges of living with and adapting to FTD. FTD was perceived as a threat to multiple aspects of the lives of bloggers, notably as a threat to their sense of self. Within the blogs written by caregivers, there was a similar perception of FTD as a threat to the selfhood of the affected individual. Several coping strategies were described by FTD bloggers who used them to adapt to this threat. Key emotion-focused coping strategies included talking to others with dementia (8 of 8, or 100%) and reframing fears into optimistic thoughts (8 of 8, or 100%). Key task-focused coping strategies included establishing routines and reminders (8 of 8, or 100%), seeking rest and isolating oneself (7 of 8, or 87.5%), maintaining normalcy through hobbies (6 of 8, or 75%), and educating oneself about FTD (6 of 8, or 75%). Caregiver bloggers also described themes of educating oneself about FTD and talking to other caregivers. Unique to these FTD bloggers was an overarching feeling of purpose for blogging about their disease experience, spreading awareness of what it was like to be affected with FTD, and forming a supportive online community of persons affected with and aware of their FTD. Illness blogs are a useful medium for understanding the lived experience of a condition. Further study is needed to assess connections between these perceptions of illness and personhood and coping strategies. This study marks the first endeavor to understand the awareness and impact of FTD on the affected individual. It serves as pilot data for future exploratory studies and therapeutic interventions to help individuals with FTD and their families.

\*\*Manuscript in preparation

12. **Likelihood of Use of a New Adult Genetic Risk Assessment Clinic.** Dana Petry, Advisor: Lori Erby, PhD, ScM 2013. Oral presentation NSGC 2013.

### **Abstract**

Motivated by the completion of the Human Genome Project in 2003, scientists and doctors have begun to explore the possibility of a more personalized approach to medicine. The Executive and Preventive Health Program is considering the addition of an adult genetic medicine clinic to serve those who are interested in learning about the role of genetic factors in their health. More information about patient preferences for genomics services provided in a clinical setting could allow providers to better tailor their services in order to fit the needs of their clients and enhance patient satisfaction. The goal of this study was to assess the factors that could drive early use of a regionally based adult genetic risk assessment clinic for common chronic conditions. A representative sample of current members of the Johns Hopkins Executive and Preventive Health Program completed a web-based survey including questions on patient demographics,

personal and family health history, and various factors related to likelihood of use of the potential clinical service. The primary outcome variables were likelihood of use and willingness to pay. A total of 204 participants completed the survey. The mean age of respondents was 54 years old. Respondents were predominantly male (72%), Caucasian (93%), married (90%), had a post-graduate education (64%), and had an annual household income of greater than \$160,000 (91%). Overall, a majority of respondents reported that they were likely to request the service and believed they could find a way to pay for it out-of-pocket. A majority also had generally positive beliefs about genetics, science, and technology and valued the importance of the services offered and potential information learned from a genetic evaluation. These positive beliefs and self-reported feelings of being at higher risk of developing a multifactorial genetic condition were commonly associated with increased likelihood of use. These results suggest that there is significant interest in the types of genetic services proposed in this study. Future research should examine more generalizable populations. Additionally, researchers should consider conducting longitudinal studies to measure actual service use as compared to hypothetical use given that the two are often different.

**13. Translation and Validation of a Spanish-Language Genetic Literacy Screening Tool.** Sally Ann Rodriguez, Advisor: Debra Roter, PhD, 2013. Oral presentation NSGC 2013. Published in *Health Psychology*

### **Abstract**

**Background & Objectives:** Numerous studies have reported the wide prevalence of disparities among minorities in various areas of healthcare, and many of these inequalities have been related to low health literacy. Latinos represent one group in particular that has been shown to have both low health literacy and some of the poorest health outcomes. Given the increasing importance of genetics in healthcare and the rapidly growing population of Latinos in the U.S., it is critical to assess this population's genetic literacy. This study aimed to translate and validate a Spanish-language genetic literacy measure and subsequently examine the relationship of genetic literacy in the Latino population to various demographic factors and genetics-related outcomes. **Methods:** This study involved a cross-sectional design with an interviewer-administered questionnaire. Eligible individuals were Latinos between the ages of 18 and 75 in Maryland, who self-reported Spanish as their primary language. Recruitment was conducted through convenience sampling. The genetic literacy measure components were adapted from existing English-language measures [Erby et al.'s (2009) REAL-G and Hooker's (2009) Familiarity and Comprehension] and an existing Spanish-language health literacy measure was used for concurrent validity analysis [Lee et al.'s (2006) SAHLSA]. **Results:** A total of 116 individuals completed the survey. The Spanish-language REAL-G was found to correlate well with the SAHLSA (Pearson's  $r = .771, p < .01$ ). A cut-off score of 59 out of 62 was found to adequately distinguish between individuals with low versus high genetic literacy. There was a significant correlation between genetic literacy and educational exposure and acculturation. Genetic literacy was also higher in individuals who reported taking an English class and learning about genetics in school. There was no correlation between genetic literacy and self-efficacy to discuss family health history with family members or healthcare providers. **Conclusions:** Our data demonstrates the concurrent validity of Erby et al.'s REAL-G in the Latino population. This is an important finding, as a Spanish-language genetic literacy tool does not currently exist. Future studies should further investigate genetic literacy in the Latino population in other parts of the U.S., as our study participants may not be representative of the national Latino population.

Rodriguez SA, Roter DL, Castillo-Salgado C, Hooker GW, Erby LH. Translation and validation of a Spanish-language genetic health literacy screening tool. *Health Psychol.* 2015 Feb; 34(2): 120-9. <http://psycnet.apa.org/journals/hea/34/2/120/>

*Class of 2012.*

14. **Parental Disclosure of G6PD and Its Relationship To Child Health.** Yue Guan, Advisor: Debra Roter, DrPH, MPH, 2012. Poster Presentation NSGC 2012. Published in *Arch Dis Child*

#### **Abstract**

Glucose-6-phosphate deficiency (G6PD) is an X-linked enzyme deficiency that commonly manifests as food-induced or drug-induced acute hemolytic anemia but may lead to permanent neurological damage or death if inadequately managed. The challenges of preparing children to independently self-manage their condition are considerable, and health care professionals encourage parents to disclosing age-appropriate illness information to the affected child. Yet, little work has been undertaken to understand parental disclosure regards G6PD that may be related to better physical and psychosocial health of affected children. This study was designed to explore associated factors and patterns of parental disclosure of G6PD to an affected child and its relationship to child health. A cross-sectional study of individual parents of 94 children affected with G6PD from Taiwan, Hong Kong and the mainland of China was conducted using paper or web-based survey instruments in Chinese. Socio-demographic characteristics, family history, exposure to G6PD health education and attitudes regarding G6PD were assessed along with parent-reported of the child's age at disclosure and the extent of disclosure discussion for each of 9 key topics. Child health was assessed using the Chinese version of the Child Health Questionnaire-Parent Form (CHQ-PF28) and a 13-item G6PD symptom list. 44.7% of study children were reported to have experienced at least one clinically significant symptom of acute hemolytic anemia. Children with an anemia symptom history scored significantly lower on measures of physical and psychosocial health. More extensive parental disclosure regarding G6PD was associated with better child health in both physical and psychosocial domains. Parental disclosure was positively associated with child age ( $r=0.19$ ;  $p=0.04$ ), sense of control of G6PD ( $r=0.22$ ;  $p=0.02$ ), positive emotions related to G6PD ( $r=0.23$ ;  $p=0.01$ ), and better quality of parent-reported G6PD education received from providers ( $r=0.37$ ;  $p<0.001$ ). One of the modifiable factors found to be positively related to parental disclosure was the quality of G6PD education reported by parents to have been received from providers. This finding highlights opportunities for educational and behavioral interventions directed toward families and children with G6PD. Developing and testing the feasibility and effectiveness of interventions aimed to construct more accurate and positive illness representations of G6PD, facilitate parental disclosure to children and empower children to self-manage G6PD are important avenues for future research in assuring optimal child health.

Guan Y, Roter DL, Huang A, Erby L, Chien Y, Hwu W. Parental discussion of G6PD deficiency and child health: implications for clinical practice. *Arch Dis Child.* 2014 Mar; 99(3): 251-5. <http://www.ncbi.nlm.nih.gov/pubmed/24291731>

15. **The Role of Family Functioning in Promoting Adaptation Among Siblings of Individuals with Duchenne Muscular Dystrophy.** Maria Belen Pappa, Advisor: Lori H. Erby, ScM, PhD, 2012. Oral presentation NSGC 2012.

#### **Abstract**

Duchenne muscular dystrophy (DMD) is an early onset X-linked recessive condition that progressively affects all voluntary and cardiac muscles. The goal of this study was to better understand the relationship of family functioning variables, including DMD-specific communication, with adaptation in unaffected siblings of children with Duchenne muscular dystrophy (DMD). Existing studies on this issue have often relied on parental reports of family functioning and sibling adaptation outcomes, yielding inconclusive results. Studies exploring DMD-specific communication are qualitative in nature and scarce. The study involved a cross-sectional research design with self-administered quantitative surveys and three open-ended questions. The study population consisted of twenty-nine parent-sibling dyads of individuals with DMD. Participating parents were asked to report on their family's functioning, family demographic characteristics, parent-child DMD-specific communication, and child behavior. Participating siblings were asked to report on their family's functioning and their self-assessment of their own adaptation, self-concept, and behavioral outcomes. More effective family functioning was associated with significantly higher levels of adaptation, self-concept, and pro-social behaviors and lower levels of behavioral problems. Children in families that talked more about DMD reported significantly better behavioral outcomes. The number of years lapsed since diagnosis of DMD had a significant impact on the extent to which parents discussed DMD with the unaffected child. Talking more about 'shortened life expectancy' was associated with higher levels of adaptation in the unaffected child ( $r=0.410$ ,  $p=0.027$ ). Family functioning was shown to be a predictor of psychosocial adaptation in unaffected siblings of individuals with DMD. As one specific component of family functioning, the extent to which families discuss DMD-related topics may play a role in promoting adaptation in these children. Family centered interventions fostering open communication may be particularly beneficial in this population. Further work is needed to better understand the role of stressor-specific communication in promoting sibling adaptation.

**16. Telling the Story: Understanding the Communication Process Following a Cancer Genetic Counseling Visit.** Tamandra Kyeon Morgan, Advisor: Lori H. Erby, ScM, PhD, 2012. Oral presentation NSGC 2012.

**Abstract**

The ways in which family members communicate with one another about hereditary cancer risk may have a significant impact on screening use and choices about predictive genetic testing. There have been many studies examining aspects of family communication of hereditary cancer risk but few have included a significant number of African American families. The lack of studies addressing how African American patients communicate about genetic risks for cancer with their relatives is a hindrance to facilitating communication strategies in this patient population. The proposed study is a mixed methods investigation aimed at understanding how communication of hereditary breast and ovarian cancer risk occurs in African American families. This study will seek to describe how African American women communicate with their family members about the information received during the genetic counseling process for BRCA1/2 genetic testing by analyzing data from two sources. The data collected from data source one of this study will be from female analogue clients who were recruited from the general population in Baltimore, Maryland to watch a videotape of a pre-test cancer genetic counseling session. The analogue clients were asked to imagine they were the patients in the visit and to respond to several open-ended questions about what they would tell their family members about what they learned from the session. A quantitative content analysis of the data from the open-ended responses will be conducted to identify the frequency of commonly stated words, phrases and concepts related to the

respondents' characterization of the content of their family communication. From data source one of this study we will obtain information on what women report they would share with their family members and the words they report they would use. Data source two of this study will involve in-depth qualitative interviews with 40 African American women who have tested positive for a BRCA1/2 mutation. These interviews will seek to understand how test results and information from the genetic counseling process were actually shared with family members. These interviews will seek to not only further describe what information individuals reported sharing with their family members but also how the process of communication unfolded. From these two forms of data, this study will describe the family communication process of hereditary cancer risk among African American women.

**17. Participating in Whole-Genome Research: Insights from Participants From Across the Health Spectrum.** Leila Jamal, Advisor: Barbara Biesecker, PhD, MS, 2012. Beth Fine Kaplan Student Abstract award. Oral Presentation NSGC 2011. Poster presentation NSGC 2012. Published in *European Journal of Human Genetics*

### **Abstract**

Since 2007, the cost of sequencing a diploid human genome has fallen from approximately \$9 million per genome to \$5,000 for projects of 10 samples or more (Wetterstrand 2011; Illumina, 2011). The drop in sequencing costs has coincided with rapid expansion in the range of technologies for data-sharing and analysis available to both amateurs and experts. As consensus practices for collecting, storing, and analyzing genomic sequence data remain lacking, informed consent for research involving whole-genome and whole-exome sequencing (WGS/WES) is being conducted under uncertainty arising from the use of large data sets that favor hypothesis-generating methods of inference. The surrounding regulatory environment has failed to keep pace, resulting in ongoing debates regarding genomic data access and control (Hudson, 2011). For this reason, informed consent protocols for research involving WGS/WES are experimenting with different models, drawing on scarce evidence for best practices (Lunshof, Chadwick, Vorhaus, & Church, 2008; Rotimi & Marshall, 2010). This goal of this study was to describe themes expressed by research participants enrolled in one of two NIH protocols involving WGS/WES. The purpose of distilling relevant constructs from these interviews was to generate subject matter for an expanded research agenda about the optimal design of informed consent protocols for WGS/WES research. This description of participants' experiences is also intended to inform genetic counselors who aim to adapt their practice to the demands of the whole-genome era. Fifteen participants in either the ClinSeq™ or Whole Genome Medical Sequencing for Gene Discovery (WGMS) protocols were interviewed 2-8 weeks after their initial enrollment visit to the NIH. An interview guide was developed iteratively, and major themes were identified and coded. A qualitative descriptive analysis was carried out, focusing on a subset of themes that were most commonly referenced. Major topics that emerged included the purpose of informed consent, motivations for participation, expectations regarding research results that would be returned, informational privacy and confidentiality. Eight individuals were interviewed from the WGMS study and seven were interviewed from the ClinSeq™ study. Recruitment is ongoing, and the results included in this interim analysis will provide a basis for more focused interviews among a wider sample of participants. While it is not possible to draw exhaustive conclusions about the perspectives of participants from the sample under study, these preliminary data suggests that participants in whole-genome research value the informed consent process as an opportunity to establish some control over the terms of their research participation. Expectations regarding return of results

reflect uncertainty and are influenced by past medical experiences. Individuals value privacy and confidentiality for their ability to protect against discrimination and to preserve control over the perceptions others have of them. Most participants expect to be re-contacted by the study even if their genome sequence data yields no results of interest.

Jamal L, Sapp JC, Lewis K, Yanes T, Facio FM, Biesecker LG, Biesecker BB. Research participants' attitudes towards the confidentiality of genomic sequence information. *Eur J Hum Genet.* 2014 Aug;22(8):964-8. <http://www.nature.com/ejhg/journal/v22/n8/full/ejhg2013276a.html>

*Class of 2011.*

18. **The Role of Social Comparisons in Coping and Quality of Life Following a Prostate Cancer Diagnosis.** Sarah S. Kalia, Advisor: Debra Roter, ScM, 2011. Poster presentation NSGC 2010.

### **Abstract**

Prostate cancer is a chronic condition that affects one in six men. A cancer diagnosis is accompanied by uncertainty about how cancer will affect one's life. Many prostate cancer patients also grapple with uncertainty regarding the best treatment option or whether to choose active surveillance. Prostate cancer treatment and decision-making regarding treatment may affect patients' quality of life and elicit attempts to cope. One way of coping with the cancer experience may be to compare oneself to others, an approach that is postulated to be more common in uncertain situations. The interpretation of these social comparisons may affect one's quality of life. To investigate the relationships among cognitive appraisals; coping, including social comparisons; and quality of life among men who have been diagnosed with localized prostate cancer and attend prostate cancer support groups. A cross-sectional, mixed methods survey was used to investigate relationships between appraisals, social comparisons, coping, and quality of life. Participants were recruited from prostate cancer support organizations. Data were collected through online and paper surveys. 186 individuals participated in the study. Factor analysis suggested that the four types of social comparison measured in this study could be reduced to two—positive and negative. Overall, participants reported making more positive than negative social comparisons. Positive social comparisons were correlated with active coping and negative social comparisons with avoidant coping. Positive social comparisons predicted better reported quality of life, while negative social comparisons predicted poorer reported quality of life. The results suggested that positive and negative social comparisons are distinct cognitive processes rather than opposite ends of a continuum. The data indicated that men in the study population do compare themselves to others. More commonly, their social comparison interpretations reflect favorably upon their own situation. A man's interpretation of social comparisons as positive or negative may be a determinant of his perceived quality of life. These findings are relevant to clinicians who help men to manage the psychosocial implications of a prostate cancer diagnosis. Future interventions to improve quality of life could involve modifying individuals' social comparisons toward more positive interpretations.

Umstead KL, Kalia SS, Madeo AC, Erby LH, Blank TO, Visvanathan K, Roter DL. (2018) Social comparisons and quality of life following a prostate cancer diagnosis. *J Psychosoc Oncol.* May-Jun;36(3):350-363. <https://www.ncbi.nlm.nih.gov/pubmed/29424665>



19. **Managing the Need to Tell: Strategic Disclosure of Thalassemia in Singapore.** Neha Kumar, Advisor: Rajiv Rimal, PhD, 2011 Poster presentation 2012.

**Abstract**

Thalassemia is a chronic, inherited hematological disorder. Studies have shown that affected individuals have difficulty adhering to their treatment regimen and that thalassemia negatively affects individuals' mental health, quality of life, sense of self, education and employment prospects, and family and social relationships. Yet, little is known about affected individuals' overall experiences with and perceptions of thalassemia. The concept of stigma was used to explore these experiences and perceptions among individuals with thalassemia in Singapore. The study specifically examined one component of stigma, discretionary disclosure. Semi-structured interviews were conducted with sixteen individuals with thalassemia over age 14 years and fourteen parents of individuals with thalassemia. Interviews focused on individuals' family, social and professional lives with thalassemia; their feelings and/or experiences of stigma; who they told about their diagnosis and what information they provided; the consequences of their disclosure decisions; and the factors influencing their disclosure decision-making. The interviews were transcribed and subjected to thematic analysis. Results indicated that affected individuals tended to fully disclose their thalassemia to family members. With people outside the family, individuals tended to either downplay their thalassemia or avoid disclosure, and in particular, chose not to disclose information about certain aspects of their treatment, the potential complications of thalassemia, and the psychosocial impact of their thalassemia. Moreover, with people outside the family, disclosure was considered only in response to disclosure triggers, such as being asked questions about one's medical management. These triggers prompted a consideration of various factors that together determined individuals' disclosure decisions. These included social, strategic, normative and practical factors, stigma, individuals' desire for and/or aversion towards special treatment, and the consequences of prior disclosures. Factors previously noted in the literature including the perceived positive consequences of disclosure and the risk of discovery were found to be less important in this study. This may be related to the unique nature of thalassemia as well as the Singaporean cultural context. These results provide insight into ways healthcare providers can support their patients through their disclosure decisions. Results also provide direction for future work that can further explicate the disclosure decision-making process.

[Kumar N, Turbitt E, Biesecker BB, Miller IM, Cham B, Smith KC, Rimal RN \(2019\) Managing the need to tell: Triggers and strategic disclosure of thalassemia major in Singapore. \*Am J Med Genet A\*. \(Epub ahead of print\)](#)

20. **Genetic Counselors' Implicit Attitudes about Race and Ethnicity and their Relationship to Communication in the Genetic Counseling Session.** Kendra Lee Schaa, Advisor: Barbara Biesecker, MS, 2011. Oral presentation NSGC 2011. Published in *Health Psychology*

**Abstract**

Implicit racial attitudes are thought to shape interpersonal interactions and may contribute to health care disparities. There have been few studies directly linking implicit attitudes to health care communication and no studies describing genetic counselors' attitudes. The goal of this study was to investigate implicit racial attitudes in genetic counselors and explore how attitudes relate to counselors' exposure to diverse populations, previous cultural competence/diversity education,



self-rated performance in communicating with minority clients, and actual communication with simulated clients of varying race during genetic counseling sessions. A nationally representative sample of genetic counselors completed a web-based survey of experience with diverse populations, followed by a Race Implicit Association Test (IAT). A subset of these counselors had participated in an earlier study in which they provided counseling to simulated clients of varying race in regard to prenatal and cancer risks. For this group, session communication was analyzed and related to the counselors' Race IAT through Spearman's rank correlations, stratifying by simulated client race. A total of 226 genetic counselors responded to the survey and completed the Race IAT; 77 of these had completed a visit with a simulated client in a previous study. The included manuscript demonstrates the results from aims related to the relationship between IAT scores and communication within simulated sessions. Genetic counselors showed a moderate prowhite implicit bias on the Race IAT ( $M=0.39$ ,  $SD=0.36$ ). Counselors with a greater degree of prowhite bias used significantly less rapport-building talk and showed lower ratings of positive global affect in sessions involving African-American and Hispanic clients, however, these counselors did not differ in their own ratings of satisfaction with their communication with these clients. Genetic counselors, like other health care providers, hold moderately pro-white implicit attitudes. Counselors with higher pro-white bias communicated less effectively when in counseling sessions with minority simulated clients yet appeared unaware of these effects. Interventions aimed at increasing awareness of implicit attitudes among counselors may improve racially discordant counseling sessions. Additional analyses will focus on the relationships between implicit attitudes, exposure, and diversity education. Future research should examine the relationship between implicit attitudes and disparities in client outcomes.

Schaa K, Roter D, Biesecker B, Cooper L, Erby L. Genetic counselors' implicit racial attitudes and their relationship to communication. *Health Psychol.* 2015 Feb;34(2):111-9. <http://psycnet.apa.org/journals/hea/34/2/111/>

**21. Assessing the Feasibility of a Coping Effectiveness Training Intervention for Caregivers of Children with Autism Spectrum Disorders.** Christy L. Haakonsen, Advisor: Anne Madeo, MS, 2011. Poster presentation NSGC 2010.

### **Abstract**

Research suggests that caregivers of children with Autism Spectrum Disorders (ASD) may find it difficult to feel a sense of control and to cope with the overall physical and emotional demands of caring for their child. One study found that higher levels of perceived personal control (PPC) and the use of problem-focused coping strategies were associated with caregivers' adaptation to their child's condition. Furthermore, there has been a growing interest in developing interventions targeting constructs involved in the adaptation process, namely PPC and coping. However, there have been few studies of these types of interventions. Research has shown that a Coping Effectiveness Training (CET) intervention has enhanced coping self-efficacy in several populations. This intervention also incorporates appraisals of one's ability to control a particular situation. The goal of this research was to assess the feasibility of a Coping Effectiveness Training intervention designed to enhance perceived personal control and coping self-efficacy in caregivers of children with Autism Spectrum Disorders. A randomized treatment-control design was used to investigate whether the CET was feasible to implement among caregivers of children with ASD. The primary outcome variables were related to the feasibility of the intervention: participation, reasons for withdrawal, participants' experiences within the intervention setting, participants'

experiences in applying the intervention, and coping effectiveness. Secondary outcomes were changes in PPC and coping self-efficacy. The conceptual framework and key variables were adapted from Lazarus and Folkman's Transactional Model of Stress and Coping. Thirty caregivers of children with ASD were recruited from support groups, autism resource centers, and four clinics. Participants in both the treatment and control groups completed baseline and follow-up surveys. Those in the treatment group received the intervention over two individualized sessions. Those in the control group received two standard care client-centered sessions. Twenty-eight participants were randomized to either the treatment or control group. Of these, 24 participated in the first session (13 treatments and 11 controls). Twenty-two participated in the second session (12 treatments and 10 controls) and were included in the final analysis. In total, six individuals withdrew from our study, which was due mostly to scheduling difficulties. The mean age of the study participants and their children was 38.2 years and 5.4 years, respectively. Participants were predominantly female (95.5%), married (63.6%), Caucasian (68.2%), had a postgraduate education (45.5%), and had an annual household income greater than \$70,000 (50%). Caregivers predominantly provided positive feedback on the intervention (i.e. discussions, worksheets, and education related to control and coping), including the practicality and usefulness of the skills that were learned. Participants also reported that they were successfully able to match appropriate coping strategies to their appraisal of a stressful situation as controllable or not. There were no differences within or between the treatment and control groups with regard to changes in their control beliefs as a result of the intervention (all  $p > 0.06$ ). The treatment group indicated significantly increased coping self-efficacy at follow-up versus baseline ( $p = 0.02$ ). However, the difference between groups was not significant when comparing the pre-post changes. These results suggest that Coping Effectiveness Training is feasible to implement in caregivers of children with ASD. Overall, the findings demonstrate that the intervention is useful and acceptable within our study population. There were significant increases in coping self-efficacy in the treatment group from baseline to follow-up. This indicates that participation in the intervention resulted in individuals gaining more confidence in their ability to cope, which may result in less adverse psychological outcomes. Similar results have been found in another study which implemented the CET in HIV+ men. However, this result must be viewed with caution as there were not significant changes in coping efficacy between the treatment and control groups. Nevertheless, given that this intervention was found to be feasible within our study population, our results support the future development of a phase II study of this intervention in a larger population.

Haakonsen Smith C, Turbitt E, Muschelli J, Leonard L, Lewis KL, Freedman B, Muratori M, Biesecker BB. (2018) Feasibility of coping effectiveness training for caregivers of children with autism spectrum disorder: A genetic counseling intervention. *J Genet Couns.* Feb;27(1):252-262. <https://www.ncbi.nlm.nih.gov/pubmed/28879629>

## 22. **Impact of Children's Risk Status for Hypertrophic Cardiomyopathy on Families with HCM.** Jane Lee, Advisor: Joan Scott, MS, 2011. Poster presentation NSGC 2011

### **Abstract**

Hypertrophic cardiomyopathy is the most common inherited cardiovascular single-gene disorder. It predisposes individuals to sudden cardiac death at any age and is the most common cause of sudden cardiac death in people under thirty years of age. Genetic testing can identify at-risk individuals; however, the impact of this potentially life-altering genetic information on families remains largely unexplored; this is in part because predictive testing of children for adult-onset

diseases is generally discouraged. To describe how children's genetic at-risk status for HCM affects parents, children, parenting, and family functioning as informed by parent-child dyads. In-depth interviews were conducted using a semi-structured guide to interview the parents and their children separately. Parents and children were recruited through genetic counselors and support groups. Transcripts of the interviews were coded using NVIVO software. A total of twenty-two parents and twenty-five children from twenty-two families were interviewed. Parent appraisals include fear, worry and guilt while child appraisals include fear, worry and vulnerability. Thematic analyses revealed that parents adjust by implementing HCM-targeted parenting practices and task-focused coping while children avoid thinking and talking about HCM but want open and ongoing communication when they are seeking further information as they develop cognitive and emotional maturity. This study also identified new themes about parental role of modeling that can have multigenerational impact on individuals' adaptation within the family and shed light on the interrelatedness between parental and child adaptation. This study described the impact of genetic risk information on families, specifically parental roles and parenting practices, in influencing adaptation among children at-risk for developing HCM. Parents with HCM worry about their at-risk children, while children, generally unconcerned by their at-risk status, are worried about their clinically affected parents. The intricate dynamic reflects the bidirectional dependency between parental and child adaptation that is interfaced by parenting, a potential target for interventions aimed at empowering parental roles and enhancing parenting. The results also provide evidence of the need for clinicians to facilitate age- and developmental stage-appropriate communication between parents and children. The findings also offer insight into how parent behaviors may influence child behaviors or cognitive appraisals in the context of genetic testing in minors.

*Class of 2010.*

**23. The Role of Family Functioning in Adaptation to Being a Caregiver of an Individual with Rett Syndrome.** Amanda Ellen Lamb, Advisor: Lori H. Erby, ScM, PhD, 2010. Oral presentation NSGC 2011.

### **Abstract**

This study aims to investigate the predictors of family functioning and adaptation in caregivers of individuals with Rett Syndrome (RS), a neurodevelopmental disorder affecting primarily females. After an apparently normal prenatal and postnatal period of development, individuals with RS lose intellectual functioning, fine and gross motor skills including purposeful hand use, and communicative abilities. Individuals with RS also experience a host of other medical problems including seizures and respiratory dysfunction. Prior research demonstrates that caregivers of individuals with RS experience more stress than normative samples and that family functioning plays a role in maternal mental health. However, there is much that is not understood about how cognitive appraisals, coping methods, and family functioning are related to caregiver adaptation in this population. This study is based on Thompson and colleagues' Transactional Stress and Coping Model which conceptualizes family functioning and adaptation to being a caregiver of an individual with RS. A cross-sectional research design using quantitative methodology will explore the relationships between perceived illness burden, self-efficacy, coping methods, family functioning and adaptation. In addition, an open-ended section will be included to qualitatively describe the role of family relationships on the caregivers' perception of their ability to care for their child with RS. Caregivers of individuals with RS will be recruited through an international RS organization, a national RS educational meeting, and several national RS clinics. Eligible participants will be able to complete a paper or online version of the survey.

Lamb AE, Biesecker BB, Umstead KL, Muratori M, Biesecker LG, Erby LH. Family functioning mediates adaptation in caregivers of individuals with Rett syndrome. *Patient Educ Couns*. 2016. Epub ahead of print. <http://www.sciencedirect.com/science/article/pii/S073839911630283X>

**24. Informed Choice and Persuasion in Direct-to-consumer Genetic Testing (DTCGT)**

**Websites: A Content Analysis of Risks, Benefits, and Limitations.** Amanda Adam Singleton, Advisor: Kim Kaphingst, ScM, 2010. Oral presentation NSGC 2011. Published *J Genet Counsel*

**Abstract**

With the click of a mouse, a credit card, and a cheek swab, consumers can purchase access to personal genetic information related to many health conditions. Direct-to-consumer genetic testing (DTCGT) refers to the ability of individuals to obtain a genetic test without a healthcare intermediary (Genetics Home Reference 2008). Health-related DTCGT is available for many purposes including carrier testing for cystic fibrosis, predictive testing for Parkinson disease, and susceptibility testing for common diseases such as Type II Diabetes. In order to make an informed choice about whether to undergo testing consumers must learn about the complexities of genetic testing such as the potential risks, benefits, and limitations of the test results. An informed choice is based on relevant, high quality information and will reflect the values of the decision maker towards undergoing a genetic test (Marteau and Dormandy 2001). In addition to the information itself, persuasive techniques used in marketing these tests can impact a person's ability to make an informed choice by affecting an individual's attitudes towards testing. The purpose of this study was to perform a content analysis of the 23 health-related DTCGT company websites in existence in July 2009 using qualitative and quantitative methods to describe what risks, benefits, and limitations of genetic testing are presented to consumers, as well as how this information is presented from a persuasive perspective.

Singleton A, Erby LH, Foisie K, Kaphingst K. Informed choice in direct-to-consumer genetic testing (DTCGT) websites: a content analysis of risks, benefits and limitations. *J Genet Counsel* 2012 June; 21(3). 433-9. <http://www.springerlink.com/content/5617176524076m54/?MUD=MP>

**25. The Roles of Trust & Respect in Patient Reactions to Race-based & Personalized**

**Medicine Vignettes: an Experimental Study.** Morgan Nicole Butrick, Advisor: Debra Roter, DrPH, MPH, 2010. Poster presentation NSGC 2011. Published *Genet Med*

**Abstract**

Amidst numerous academic commentaries on race-based and genetically personalized medicine, translational research on the topic is in its infancy. Previous focus-group studies have revealed substantial attitudinal barriers to public acceptance of race-based medicine; little is known about public acceptance of genetically personalized medicine. This study yielded experimental findings that begin to shed light on the public's reaction to these three prescription models. The conceptual framework is based on relationship-centered care and the risk information seeking and processing model. These theories recognize the importance of interpersonal influence within health care interactions, underscore the moral dimensions of patient-physician relationships, and describe the factors that predict how individuals attend to and process information. This study describes

analysis of participants' cognitive, emotional, attitudinal, and hypothetical behavioral response to 3 randomly assigned vignettes portraying the prescription of conventional, race-based, and genetically personalized medicine for common disease. The objective of this study is to understand the relationships among the type of medication offered, race, literacy, experience with discrimination, background trust, and four categories of outcomes: attitudinal (trust and respect), emotional, cognitive (response efficacy and information sufficiency), and adherence intentions. Participants were recruited from the Johns Hopkins Outpatient Center in Baltimore, MD, and before beginning a brief survey, completed a literacy screen. Participants with literacy less than the 6th grade level had their surveys read aloud. Participants were given \$5 gift cards to RiteAid for their time. A total of 404 participants were recruited to take the survey. Overall, participants reported different appraisal patterns based on their randomized vignette assignment. Race-based medicine was consistently appraised most negatively for both minorities and non-minorities. Specifically, participants reported less positive emotion, lower confidence in the medicine's efficacy and safety, perceived less respect from the prescribing physician, and lower intention for adherence in response to the race-based medicine vignette. Genetically personalized medicine was appraised comparably to conventional medicine, with the exception of adherence intention. While all participants reported less adherence intention the genetically personalized medicine, this trend was especially pronounced among racial minorities. Trust in the vignette physician was a strong partial mediator of the relationship between randomized vignette and adherence intention. This study demonstrates the varied patterns of appraisal based on reactions to hypothetical scenarios portraying the prescription of conventional, race-based, and genetically personalized medicine. It is likely that race-based medicines are a transient bump in the road to genetically personalized treatment options; this approach will likely be extinguished by refined technology, scientific criticism, and the negative patient reactions show in this and other studies. Yet, DNA-based personalized medicine is on the horizon. This study is among the first in what is sure to be a fruitful area of translation research, and demonstrates reluctance of general population, especially racial minorities, to embrace this technology. But moreover, this study opens avenues to enhance adherence through improved trust and partnership in the doctor-patient relationship.

Butrick M, Kaphingst K, Erby LH, Haywood C, Beach MC, Levy HP. Patient reactions to personalized medicine vignettes: an experimental design. *Genet Med* 2011 May;13(5): 421-8. <http://www.nature.com/gim/journal/v13/n5/full/gim9201172a.html>

26. **Adaptation Among Adolescents and Adults with Klinefelter Syndrome: The Role of Illness Perceptions, Stigma, and Coping.** Amy Elizabeth Turriff, Advisor: Barbara Biesecker, MS, 2010. Oral presentation 2011. Published *Genet Med* and *Pat Educ Couns*

### **Abstract**

Klinefelter syndrome (XXY) is the most common chromosomal aberration among men, with an estimated frequency of 1:500 to 1:1000. Affected individuals may have hypogonadism, gynecomastia, learning disabilities, infertility, and delay and underdevelopment of secondary sexual characteristics. Despite its high prevalence, prior descriptions of the experience of living with XXY are limited to medical information and some reports on cognition and behavior. Previous research has raised concerns that individuals with XXY may struggle to adapt to their diagnosis due to decreased language skills, lowered self-esteem, and passivity. To understand the impact of living with XXY as an adolescent or an adult, and to examine the factors that contribute to adaptation. A cross-sectional design with quantitative methodology was used to examine the

relationships among illness perceptions (perceived consequences and perceived severity), perceived stigma, coping, and adaptation. In addition, depression was included as a potential confounder, and time elapsed since learning of diagnosis was included as a potential moderator of the relationship between illness perceptions, perceived stigma, coping, and adaptation. Study design was informed by Lazarus and Folkman's Transactional Model of Stress and Coping. Adolescents and adults with XXY were recruited through regional and national XXY support networks (websites, listservs, conferences, newsletters). The majority of participants completed the self-administered survey online, though some participants completed a paper version of the survey. Of the 249 respondents, 95.6% were Caucasian, 75.6% did not have children, 37.9% had graduated from college and 36.9% had completed some college. Approximately half were partnered or married (48.8%) and were diagnosed in adulthood (47.6%). Depressive symptoms were prevalent among study participants (67%). Multivariate analysis (n=210) indicated that the use of emotion-focused coping strategies, illness perceptions, and education were significant predictors of depressive symptoms. Multivariate analysis (n=210) including adaptation as the outcome demonstrated that problem-focused coping was the greatest predictor of adaptation, followed by perceived stigma, and age. Multivariate analyses with interaction terms indicated that perceived stigma and problem-focused coping both vary by time elapsed since learning of diagnosis. In addition, coping was found to mediate the relationship between illness perceptions, perceived stigma and adaptation. This study suggests that adolescents and adults with XXY are generally well adapted, and it highlights the role of perceived stigma, coping, and age in predicting adaptation. The findings also suggest that individuals with XXY are at increased risk for clinical depression. Factors associated with depressive symptoms among study participants were perceived negative consequences, perceived stigma, and education. Finally, this study contributes to the broader understanding of perceived stigma and adaptation, two concepts important to consider among individuals living with genetic conditions.

Turriff A, Levy HP, Biesecker B. Factors associated with adaptation to Klinefelter syndrome: The experience of adolescents and adults. *Patient Educ Couns*. 2015 Jan;98(1):90-5.

<http://www.ncbi.nlm.nih.gov/pubmed/25239793>

Turriff A, Levy H, Biesecker B. Prevalence and psychosocial correlates of depressive symptoms among adolescents and adults with Klinefelter syndrome. *Genet Med* 2011 13(11):966-972.

<http://www.nature.com/gim/journal/v13/n11/full/gim2011161a.html>

*Class of 2009*

**27. Screening Behavior in Adults with Hereditary Hemorrhagic Telangiectasia: Illness Perceptions and the Health Belief Model.** Melanie D. Baxter, Advisor: Alan Guttmacher, MD, 2009. Oral presentation NSGC 2009.

### **Abstract**

The study aimed to better understand the factors that influence screening behaviors of adults with hereditary hemorrhagic telangiectasia (HHT). HHT is a chronic condition, but with early diagnosis followed by adherence to recommended screening guidelines, the major complications of this disorder can be lessened or entirely avoided, and disability or even death can be prevented. Despite this, many individuals with HHT do not follow recommended screening guidelines, even when they are aware of the risk of serious complications. The Health Belief Model (HBM) framed this study of HHT screening. In addition to the HBM constructs (perceived susceptibility, perceived benefits, perceived barriers, self-efficacy, response efficacy, and cues to action), this study also



considered the role of illness representations. Participants were recruited from the HHT Foundation International, Inc., the “HHT Awareness” Facebook group, and six HHT clinics, in addition to a snowball recruitment technique. Eligibility criteria included adults who self-reported having a diagnosis of HHT. A cross-sectional survey consisting of closed and open-ended items was used to investigate the relationships among the domains of illness representations, HBM constructs, and the main outcome measure of HHT-specific screening behaviors in line with recommended guidelines. A total of 320 participants were included in analysis. Rates of CAVM screening, PAVM screening, and HHT annual check-up in this study population were 82.0%, 67.1%, and 56.5%, respectively. Ordinal logistic regression analysis showed that perceived barriers ( $\beta = -0.114$ ,  $p < 0.001$ ), perceived susceptibility ( $\beta = 0.117$ ,  $p < 0.05$ ), treatment control ( $\beta = 0.078$ ,  $p < 0.05$ ), and emotional representations ( $\beta = 0.067$ ,  $p < 0.05$ ) were significant predictors of HHT screening. Qualitative findings revealed emotional and cognitive perceived barriers to HHT screening, including a perceived overall lack of healthcare providers who are familiar with and/or knowledgeable about HHT and a perceived lack of effort by healthcare providers to learn about HHT. Findings suggest that screening rates are not ideal in the population of adults with HHT, and that many factors are influencing behavior. These results also provide evidence for the overall educational need within the healthcare community regarding HHT, and may suggest several approaches that HCPs can consider to potentially improve screening adherence.

Baxter M, Erby L, Roter D, Bernhardt BA, Terry P, Guttmacher A. (2016) Health screening behaviors among adults with hereditary hemorrhagic telangiectasia in North America. *Genet Med*. (Epub ahead of print)  
<http://www.nature.com/gim/journal/vaop/ncurrent/abs/gim2016161a.html>

28. **Adaptation and Quality of Life Among Adults with Neurofibromatosis Type 1.** Julie Snyder Cohen, Advisor: Barbara Biesecker, MS, 2009. Oral presentation NSGC 2009-Best Student Abstract Award. Published *Am J Med Genet* and *Clin Genet*

### **Abstract**

Neurofibromatosis type 1 (NF1) is a genetic disorder that primarily affects the skin and nervous system. NF1 carries a significant psychosocial burden for affected individuals. Aspects that are especially challenging include the variability in severity of symptoms and medical complications, uncertainty in progression, and vulnerability to stigmatization. The literature suggests that because of these and other challenges posed by NF1, affected individuals may struggle to adapt to their condition and, consequently, experience reduced quality of life (QoL). To gain a more thorough understanding of the role of appraisals and stigma on adaptation and QoL among adults affected with NF1. A cross-sectional design was used to investigate the relationships of appraisals and stigma as predictors of adaptation and QoL. Adults with NF1 were recruited via NF support organizations and websites, and through NIH clinical research protocols. Data were collected through a web-based survey. Approximately 482 individuals completed the survey. Overall, participants perceived a high level of social stigma, and there was a high prevalence (55%) of depressive symptoms in the study population. Multivariate analyses revealed that more positive/less negative appraisals and lower perceived stigma were associated with greater levels of adaptation and higher QoL. This study also identified new themes about the ways NF1 can have a positive impact on individuals' lives, and shed light on the conceptual relationship between adaptation and QoL. This study demonstrates the role of psychosocial factors, particularly appraisals, stigma, and depression, in influencing adaptation and QoL among adults affected with

NF1. Affected individuals often struggled with adapting to their condition and experienced lower QoL. Social stigmatization was an especially challenging issue, and this may serve as a potential target for interventions aimed at enhancing adaptation and QoL. The results also provide evidence of the need for clinicians to routinely screen for depression among patients with NF1. More broadly, the findings offer insight into the relationship between adaptation and QoL, two important outcomes of living with a genetic condition.

Cohen JS, Levy HP, Sloan J, Dariotis J, Biesecker BB. Depression among adults with Neurofibromatosis Type 1: Prevalence and impact on quality of life. *Clin Genet*. 2014 Dec 23. <http://www.ncbi.nlm.nih.gov/pubmed/25534182>

Cohen, JS, Biesecker B. Quality of life in rare genetic conditions: A systematic review of the literature. *Am J Med Genet Part A* 2010 May;152A(5):1136-1156. <http://onlinelibrary.wiley.com/doi/10.1002/ajmg.a.33380/full>

29. **The Role of Hope in Adaptation to Uncertainty: The Experience of Caregivers of Children with Down Syndrome.** Megan Truitt, Advisor: Lori Erby, ScM, PhD, 2009. Oral presentation NSGC 2009. Published *Pt Educ Counsel*

### **Abstract**

Down syndrome (DS) is a condition characterized by impaired intellectual functioning and sometimes other issues that affect an individual's medical, social, and behavioral health. Although having a known genetic diagnosis may reduce some uncertainty, there are often uncertainties surrounding the prognosis of DS which extend into various aspects of a child's life. This residual uncertainty likely makes psychosocial adaptation more difficult for caregivers; yet some may view uncertainty as allowing for the opportunity of positive outcomes. In situations such as these where caregivers continue to face prognostic uncertainty, concepts such as hope may play a role in adaptation. It is not yet fully understood how caregivers adapt to having a child with DS in light of this uncertainty or the role hope plays in the process. To investigate the relationships between perceived uncertainty, hope, and adaptation in caregivers of children with DS. Participants were recruited from local and national DS groups and from a DS clinic list. A cross-sectional survey allowed for the examination of caregivers' levels of perceived uncertainty, hope, and adaptation, as well as the relationships between those three variables. The hope that caregivers had for their child in specific categories was also measured. A total of 546 surveys were eligible for analysis. Hope and adaptation were positively correlated, while perceived uncertainty was negatively related to both hope and adaptation. Perceived uncertainty and hope were found to be predictors of caregiver adaptation, with hope being the largest contributor to the variance in adaptation. Caregivers' motivation to reach their goals for their child was higher than their ability to think of ways to meet those goals, and the ability to think of ways to reach goals was significantly related to adaptation levels. Findings from this study suggest that caregivers' levels of hope and perceived uncertainty may be important concepts in the process of psychosocial adaptation. Results indicate that prognostic uncertainty tends to be perceived as a negative experience by these caregivers, being associated with lower levels of hope and adaptation. Although future studies are needed, strategies aimed at strengthening hope and reducing perceptions of uncertainty may increase caregiver adaptation.



Truitt M, Biesecker B, Capone G, Bailey T, Erby L. The role of hope in adaptation to uncertainty: the experience of caregivers of children with Down syndrome. *Patient Educ Couns*. 2012 May;87(2):233-8. <http://www.sciencedirect.com/science/article/pii/S0738399111004666>

30. **Testing for Inflammatory Bowel Disease: Predictors of Patients' Appraisals of Medical and Genetic Testing.** Gillian W. Hooker, PhD, Advisor: Debra Roter, DrPH, MPH, 2009. Poster presentation NSGC 2009. Published in *Inflamm Bowel Dis*

### **Abstract**

Recent genetic and genome-wide association studies have identified a number of susceptibility loci for IBD and clinical integration of this genetic information is not far behind. Studies of attitudes towards genetic testing in this population have revealed overwhelmingly positive responses, with a majority of individuals surveyed stating that they desire genetic testing. However, the reasons for this remain to be seen, in the absence of interventions to prevent or treat disease following genetic testing. For many, IBD is a life-long illness which poses uncertain threats to one's quality of life. In this study, Leventhal's Common Sense Model of Self-Regulation is used as a framework to describe how individuals cognitively and emotionally represent their illness in response to the threat of chronic disease, and how these representations predict responses to hypothetical clinical testing scenarios. This study had an experimental design in which participants were randomized to a vignette depicting either a genetic testing scenario or a standard "blood" testing scenario. Participants were asked a series of appraisal questions about the person in the vignette and appraisals were compared between the two vignettes. Also, participants' perceptions of their own illness were assessed and analyzed as predictors of their response to the two vignettes. Finally, a measure of genetic literacy was incorporated to examine whether genetic literacy is a predictor of response to the vignettes. Patients were recruited to take the survey through the Johns Hopkins Gastroenterology clinics either during their clinic visits or by mail. A total of 200 surveys were collected and analyzed for this thesis. The two study groups were comparable across demographic, disease-related and situational variables, as well as illness perceptions and genetic literacy. Differences were not observed in perceived control over IBD following a positive test result for the person in the vignette, nor were affective responses to the vignette (positive or negative feelings) different between the two groups. Participants were able to extrapolate information and applications offered uniquely by the genetic testing vignette. Though overall outcomes were not largely different, the factors predictive of those outcomes did differ between the two testing scenarios.

Hooker GW, Peay H, Erby L, Bayless T, Biesecker BB, Roter DL. Genetic literacy and patient perceptions of IBD testing utility and disease control: a randomized vignette study of genetic testing. *Inflamm Bowel Dis*. 2014 May;20(5):901-8. [http://journals.lww.com/ibdjournal/Abstract/2014/05000/Genetic\\_Literacy\\_and\\_Patient\\_Perceptions\\_of\\_IBD.14.aspx](http://journals.lww.com/ibdjournal/Abstract/2014/05000/Genetic_Literacy_and_Patient_Perceptions_of_IBD.14.aspx)

31. **Cultural Congruence in International Genetics Research: Perceptions of Opportunities and Challenges Among Researchers.** Melinda Simonson, Advisor: Lori H. Erby, ScM, PhD, 2009. Oral presentation NSGC 2009.

**Abstract**

Human genetics research in developing countries is becoming more common, as scientists seek situations and populations to best meet the goals of their research, and as many developing countries begin to focus on developing their own genetics research programs. However, human genetics research in developing countries may have particular challenges related to the culture of those involved in the research. Impact of cultural differences on human genetics research in developing countries has not been well studied. This study examined the investigator experience of conducting human genetics research in developing countries, with particular attention to the cultural challenges, opportunities, and strategies related to culture. Semi-structured, in-depth interviews were conducted with nine researchers with experience in developing countries. Most of these researchers had worked in Africa, although one had worked in Asia, and one in South America. The interviews were transcribed, and then analyzed for common themes in the interviews. The most frequently identified challenges to doing genetics research in developing countries were language and literacy, confusion between health care and research, conflict surrounding participants' poverty, religious differences, traditional beliefs about witchcraft and illness causation, and lack of participant autonomy. In talking about their research projects, the majority of researchers talked about diversity, awareness, sensitivity, and competence, although none used the specific terms. In discussing strategies to deal with cultural challenges, the most common themes were talking to people from the country that they're working in, learning the local language, going for an immersion experience in the culture, doing pre-study assessments, being flexible, building relationships with participants, and including local staff in the study. These results help to shed light on how researchers are overcoming cultural challenges to human genetics research in developing countries, and what strategies may be useful to individuals hoping to do research there.

*Class of 2008.*

32. **Caregiver Adaptation to Autism Spectrum Disorders.** Katie Voss, Advisor: Barbara Biesecker, MS, 2008. Oral presentation at NSGC 2008.

**Abstract**

Pervasive developmental disorders (PDD) are a group of disorders characterized by impaired communication and social skills. Little information is available for caregivers of children with PDD regarding the cause of PDD, as well as the efficacy of the existing therapies and treatments, among other things. This uncertainty may present unique challenges as parents adapt to their child's conditions, particularly as it influences a caregiver's control beliefs, search for a cause or choice of coping strategies.

A cross-sectional design was used to investigate the relationships between control beliefs, causal attributions, coping strategies and adaptation among caregivers of children with PDD. The main outcome measure was adaptation. Study design was informed by Lazarus and Folkman's Transactional Model of Stress and Coping. Three hundred and twenty four caregivers were recruited through support groups and websites designed for caregivers of children with PDD. Among the 324 respondents, the majority was female (95%), married (80%), had completed college (70%), were white (92%) and had an income greater than \$70,000 (51%). On average, the

children had been diagnosed with a PDD five years ago. Caregivers felt that they had a moderate amount of control over all aspects of their child's life, but reported having the most control over their child's medical care and treatment. Multivariate analysis revealed that higher long-term course control and control by others, problem-focused coping, and controllable causal attributions were associated with greater levels of adaptation.

In conclusion, though being a caregiver to a child with PDD has sometimes been characterized as a situation with limited opportunities for control, these caregivers reported many ways that they find control over many aspects of their child's symptoms and care. Control beliefs, particularly over long-term course, may serve as a potential target for clinical interventions aimed at enhancing adaptation. Furthermore, problem-focused coping was a significant predictor of adaptation for the caregivers in this study, which may indicate the importance of these coping strategies, particularly in the years immediately following a diagnosis.

\*\*Manuscript in preparation

**33. Family History of Heart Disease and Barriers to Screening: How Do They Affect Intentions to Get Cholesterol Screening.** Courtney Nichols, Advisor: Joan Scott, MS, 2008. Poster presentation NSGC 2008.

**Abstract**

Coronary heart disease is a common, complex disease for which individuals may lower their risk by adopting preventive behavior change. Family history has been suggested as a potentially a valuable tool for promoting preventive behavior change by assessing risk for complex diseases like heart disease. However, while family history has been shown to be a valid and reliable tool for risk assessment for coronary heart disease, the efficacy of risk information based on family history in promoting behavior change has not been well studied. If shown to be efficacious in promoting behavior change, family history holds potential as a public health tool, being more accessible to individuals with decreased access to other risk assessment strategies. Yet, it will only be most beneficial if recommended preventive behaviors are also accessible. This study sought to examine the contribution of a salience intervention of family history of coronary heart disease and perceived barriers to screening to intention to get blood cholesterol screening. In a one-time self-administered survey, a general population sample was queried about intentions to undergo blood cholesterol screening and beliefs that may influence the likelihood of taking preventive action based on the Health Belief Model (HBM). Beliefs under investigation included perceived barriers to and benefits of cholesterol screening, susceptibility and severity of heart disease, and heart disease worry. To study the role of family history salience, participants were randomly assigned into one of two groups. One group was asked to read information about family history as a risk factor for heart disease and respond to questions about their personal family history of heart disease before completing other study measures. The second group did the family history exercise only after they completed the study measures on beliefs.

Analyses did not show a significant association of an intervention for salience of family history with intention to get cholesterol screening, however, the study was underpowered to detect this effect. Simply having a positive family history of heart disease was significantly associated with higher perceived susceptibility and heart disease worry, which in turn were associated with increased intention to screen in bivariate analyses. The results also showed an association between several perceived barriers and decreased intention to screen. The most common and significant barriers were related to knowledge/awareness of heart disease and screening practices,

and to structural barriers to cholesterol screening. A stepwise regression model of perceived barriers showed that the most significant perceived barriers explained a majority of the variance in cholesterol screening intentions. A regression model including all HBM variables and sociodemographics showed heart disease worry and self-efficacy to have p-values < 0.100. However, none of the HBM variables nor having a positive family history reached statistical significance in the model. Age and time since last cholesterol check showed significant associations, with older individuals and those who recently had their cholesterol checked showing the highest intentions to screen.

Conclusions from the study are hindered by the lack of the desired sample size, which limited the power to address some objectives. The results did, however, indicate that individuals who have a positive family history for heart disease seem to understand that this increases their risk for the condition, with or without an intervention to make that risk more salient. While having a positive family history showed a trend toward increased intention to screen that did not reach significance, multivariate analyses indicated that family history may play a smaller role in intentions to screen than other factors. It is suggested that important factors in intention for cholesterol screening include overcoming perceived barriers to screening, self-efficacy for screening, past screening behaviors, and heart disease worry.

**34. The Extent and Patterns of Disclosure within the Huntington Disease Community and the Association with Adaptation to Living at Risk.** Jessica Young Adcock, Advisor: Lori Hamby Erby, ScM, PhD, 2008. Oral presentation at NSGC 2008.

**Abstract**

Little is known about the extent and process of disclosure within the Huntington's disease (HD) population. Descriptions of varying degrees of disclosure about HD status exist; however, few studies have sought to measure disclosure quantitatively and to describe patterns of disclosure. Disclosure is an important concept to consider in this population because disclosure decisions can significantly impact other at risk family members and can affect an individual's support and social isolation. In addition, HIV research suggests that a relationship between disclosure of one's HIV status and psychological adaptation to one's status may exist. This study aims to describe extent and patterns of disclosure about HD and one's status to family and friends among individuals who have tested positive or who are at risk based on family history. Additionally, this study aims to investigate the relationship of disclosure to psychological adaptation to living at risk for HD. Participants were recruited from HD clinics, HD support groups, HD online websites, and HD online mailing listservs. Eligibility criteria included individuals who tested positive for HD and who were without symptoms or individuals who were at risk for HD based on a positive family history and who were without symptoms. A cross-sectional survey consisting of closed and open-ended items was used to 1) investigate individuals' extent and patterns of disclosure about HD, 2) assess psychological adaptation to living at risk for HD, and 3) describe individuals' attitudes surrounding disclosure about HD. Among the 315 respondents, 191 surveys (136 at risk for HD, 55 with a positive HD genetic test result) were eligible for analysis. Participants were largely female, white, not of Hispanic origin, and married. Results revealed that the majority of individuals disclosed their HD status, the inheritance of HD, the features of HD, and their feelings and concerns about their HD status to the majority of members within their social network. However, the extent of disclosure about HD and one's status varied within the population, with evidence for selective disclosure and nondisclosure. Multiple regression analysis indicated that the extent of disclosure about

HD status along with number of years an individual had known their HD status predict adaptation to living at risk for HD. This study demonstrates the complex nature of HD disclosure to others and also reveals an important association between the extent of disclosure about one's status and adaptation to living at risk. These findings also provide evidence for the need for health care providers (HCPs) to assess the full extent of disclosure, given the presence of selective disclosure and association with adapting to living at risk. Finally, these results suggest ways that HCPs can assist individuals in devising disclosure plans and strategies to cope with the consequences of their disclosure decisions.

\*Manuscript in preparation

35. **Meaning making among asymptomatic adults with a positive presymptomatic genetic test result for Huntington Disease.** Pooja Ramchandran, Advisor: Rajiv Rimal, PhD, 2008. Oral presentation at NSGC 2008.

#### **Abstract**

Huntington Disease (HD) is a degenerative, ultimately fatal neuropsychiatric condition inherited in an autosomal dominant manner. Eighteen to 25% of individuals at risk for HD pursue predictive testing. A positive test result can be a psychologically-threatening event, but the genetic testing process may be an important means for some individuals to gain control and make meaning. Meaning making is considered an important component of cognitive adaptation, but it is unknown whether, and if so how, individuals who test positive for HD use meaning-making strategies in response to their test result. Purpose: This study describes the process of meaning making, and perceived barriers thereof, in adults with a positive genetic test result for HD who believe themselves to be asymptomatic. We conducted and analyzed nine semi-structured interviews that were informed by Park and Folkman's model of meaning making. Member checking interviews with these participants were conducted to ensure accurate interpretation of data. Results of this study indicate that, as expected, the immediate response to the test result was universally one of shock; this was accompanied by thoughts of despondency, before meaning making could be initiated. Participants then appraised and made positive meaning of their test results in three distinct ways: (1) searching for a cause, (2) benefit finding (including reappraisals of the experience, finding side benefits, focusing on the positive, avoiding the negative, downward social comparison, imagining worse situations), and (3) maintaining and relinquishing control. Perceived barriers to meaning making (including concerns about long-term care and risk to children) are presented. Results of this study expand the existing literature on meaning making and provide evidence for a less studied form of meaning making based in action. The findings also suggest approaches to counseling and facilitating meaning making and adaptation in individuals pursuing presymptomatic genetic testing for HD.

*Class of 2007.*

36. **Invasive Prenatal Testing Decisions in Pregnancy After Infertility.** Colleen Brown, Advisor: Barbara Biesecker, MS, 2007. Oral presentation NSGC 2007. Published *Prenatal Diagnosis*.

#### **Abstract**

Women who are pregnant after infertility often experience heightened anxiety regarding the outcome of the pregnancy. When choosing whether or not to have invasive prenatal testing they are faced with a complex decision, set in the unique context of a pregnancy that they often

perceive as exceptionally precious. To explore the invasive prenatal testing decision-making experiences of women who are pregnant after infertility. A cross-sectional design was used to investigate relationships between characteristics of the infertility experience, subjective norms, and decisional conflict associated with deciding whether or not to have invasive prenatal testing. The main outcome measure was decisional conflict. Study design was informed by Janis and Mann's conflict theory of decision making. One hundred forty one pregnant women with a history of infertility were recruited from pregnancy and infertility websites. A minority of women (28%) chose to have invasive prenatal testing. The mean level of decisional conflict was 20.4 (SD=21.7, range = 0=100); 74% of participants had lower decisional conflict. Half (49%) of women said that infertility made the prenatal testing decision easier or did not make it any harder, while 6% of participants said that infertility made the decision more difficult. The majority of medical and psychological infertility characteristics were not significantly associated with decisional conflict. In multivariate linear regression analysis, higher decisional conflict was associated with having a history of miscarriage, lower perceived severity of infertility, and subjective norms. There was an interaction effect between prenatal testing decision and subjective norms; test decisions that were incongruent with husband's preferences were associated with higher decisional conflict. Infertility may decrease decisional conflict associated with the prenatal testing decision by helping women to clarify their values and priorities. Perceived disapproval of the testing choice by other people is an important source of decisional conflict in this population. Husbands'/partners' opinions seem to be most important, although other infertile women were also influential.

Caleshu C, Shiloh S, Price C, Sapp J, Biesecker B. Invasive prenatal testing decisions in pregnancy after infertility. *Prenatal Diag* 2010;30(6):575-581.  
<http://onlinelibrary.wiley.com/doi/10.1002/pd.2529/abstract>

**37. The Experiences of Genetics Patients with Visible Differences who Facilitate Teaching in Genetics Clinics.** Jamie Dokson, Advisor: Barbara Biesecker, MS, 2007. Poster presentation NSGC 2007.

#### **Abstract**

It is common for genetics patients to facilitate the teaching of others during the course of their genetics exam. Patient response to serving as a teaching case has been studied only to a limited extent. This study describes the qualitative experience of patients with visible abnormalities in the genetics clinic when taking on a teaching role. The study aimed to improve understanding of the phenomenon of patients in educator roles, relate experiences to patient expectations, and fill a gap in the published literature. Thirty participants with visible physical abnormalities were interviewed by telephone about their experiences in the genetics clinic(s). The interviews followed a semi-structured interview guide, and were audiotaped, transcribed, and analyzed qualitatively. Data analysis elicited several common themes: Participants almost unanimously felt favorable towards current teaching practices in genetics clinics and welcomed the opportunity to educate others about their condition. No meaningful differences were found in patient reports of their experience in the genetics clinic as compared to other medical settings. Provider actions and demeanor had a considerable impact on patients' experiences. Common factors contributing to patients' views of the clinics and the genetics professionals were compiled and used to inform the development of new recommendations to further enhance educational experiences in genetics clinics.

38. **Genetic Counselors' Experience of Moral Value Conflicts with Clients.** Rachel J. Silver, Advisor: Gail Geller, ScD, 2007. Oral presentation at NSGC 2007. Published *Am J Med Genet*.

**Abstract**

Genetic counselors may be faced with situations in which they disagree on a moral level with the views or decisions of their clients. These moral value conflicts between counselors and their clients have the potential to have an emotional impact on counselors. Little is known about the range of sources of these conflicts, the ways counselors conceptualize the conflicts, the approaches counselors take to address them, or the impact they have on the counselor's life and career. This study aimed to gain insight into the nature, sources, and consequences of moral value conflicts among genetic counselors. We performed semi-structured in-depth interviews with 27 genetic counselors. Interview questions were nested within interviews for a larger study entitled "Manifestations and Consequences of Moral Distress Among Genetics Service Providers". We asked participants about their personal experiences with moral value conflicts with clients, focusing on one case they found particularly distressing. Transcribed interviews were subjected to thematic analysis. We identified a number of situations under which moral value conflicts arise for genetic counselors, in the prenatal, cancer, and pediatric settings. Many of the conflicts involve either pregnancy terminations or circumstances surrounding cancer genetic testing that have implications for other family members. We propose a framework which can be used to describe the ways genetic counselors conceptualize the nature of their conflict. The majority of participants did not consider moral value conflicts with clients to be an overwhelming source of distress in their career.

An unanticipated finding was that while most scenarios were described in distressing terms, a small number of counselors described ways in which moral value conflicts were enriching or rewarding experiences. Implications for training of genetic counselors are discussed.

Geller G, Micco E, Silver RJ, Kolodner K, Bernhardt BA. The role and impact of personal faith and religion among genetic service providers. *Am J Med Genet C Semin Med Genet*. 2009 Feb 15;151C(1):31-40.

[http://www.ncbi.nlm.nih.gov/pubmed/19170100?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/19170100?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

39. **Can Mental Illness Stigma Travel Through Blood? Exploring the General Population's Beliefs, Feelings and Behaviors Towards the Health Siblings of Individuals with Mental Illness.** Matthew Thomas, Advisor: Colleen McBride, PhD, 2007. Oral presentation at NSGC 2007-Best Student Abstract Award.

**Abstract**

Individuals with mental illness experience considerable stigma from the general population. Recent findings suggest that healthy family members of individuals with mental illness also may experience stigma because of their biological/genetic relationship with the individual with mental illness. This study aims to explore the mechanism through which the general population stigmatizes healthy family members of individuals with mental illness and whether the nature of the familial relationship (i.e. biological sibling versus adopted) is associated with stigmatizing behaviors (i.e. desire for social distance). Participants (N=307) from the Maryland Motor Vehicle Administration completed a self-administered survey that includes two vignettes. The first vignette describes a hypothetical person with mental illness and the second describes the sibling of the affected person. In order to evaluate how the biological relationship between individuals with

mental illness and their healthy relative influences social distance, we assigned half of the participants at random to view a vignette describing a biological sibling and half, an adopted sibling. The data were analyzed based on our conceptual model that illustrates the relationships between prejudiced thoughts, feelings, and discriminatory behavior towards an individual with mental illness and the resulting discriminatory behavior towards a healthy sibling. Participants' desire for social distance from an adopted sibling was not significantly different from their desire for social distance from a biological sibling,  $\bar{X}=1.86$  (0.69) vs. 1.85 (0.67), respectively;  $p=0.84$ ). The desire for social distance from a healthy sibling was almost significantly less for participants who strongly supported a genetic causal attribution ( $\bar{X}=1.76$ ) when compared to participants who weakly supported a genetic causal attribution ( $\bar{X}=1.99$ ),  $F(1,244) = 3.80$ ,  $p=0.052$ . Overall, our conceptual model received partial support as regression analyses revealed that certain prejudiced thoughts (dangerousness and prognosis) and feelings (anger, compassion, fear) towards an individual with mental illness predicted the desire for social distance from a healthy sibling. The strongest predictor of the desire for social distance from a healthy sibling was the desire for social distance from an individual with mental illness. Results suggest that individuals from the general population distinguish their desire for social distance when comparing an affected individual to his healthy sibling. Based on these findings, the concerns of some researchers that the recent focus on the genetic aspect of mental illness may have unintended discriminatory side effects for healthy biological siblings may not be warranted. Healthy biological relatives may not be at any greater risk for courtesy stigma than adopted siblings, even in an era where the biological cause of mental illness has become a primary focus in the media. Based on how the participants' views of individuals with mental illness predicted their views of healthy family members, if a more effective means of combating stigma towards the individual with mental illness arises, we would anticipate a decrease in subsequent stigma towards healthy family members.

*Class of 2006.*

#### **40. Exploring Paternal Participation in Decision-making about Diagnostic Prenatal Testing.**

Suzanna Schott, Advisor: Barbara Biesecker, MS, 2006. Oral presentation NSGC 2006.

##### **Abstract**

Making a decision to undergo diagnostic prenatal testing such as amniocentesis can be a challenge because the procedure is invasive and involves a risk to the fetus. Both parents may be highly invested in the outcome of the pregnancy, therefore male-partners are likely to have a stake in the process of prenatal testing decision-making (PTD). It would benefit genetic counselors to have a better understanding of when, how, and why male-partners participate in decision-making. The objective of the current study was to illuminate some of the factors that shape male-partner involvement in the PTD process. While there are several variables that could influence participation, this study specifically sought to identify the attitudes, beliefs, and perceptions held by male-partners that might influence their participation behavior. The conceptual framework of the Theory of Reasoned Action (TRA) was utilized to structure a questionnaire to explore these potential antecedents of paternal participation in the PTD process. Participation was defined as sharing one's thoughts and opinions about whether the woman should undergo invasive, diagnostic prenatal testing. Male partners were recruited via pregnant female patients who had been referred for genetic counseling at one of three perinatal clinics in the Washington D.C.-Baltimore region. Male partners were also recruited via general obstetric practices, via fliers and online advertisements. Generalizability of results was limited due to small sample size. Most



respondents indicated positive attitudes toward participation and strong intentions to be involved in the PTD process. The men in this sample demonstrated moderate levels of ambivalence toward participation, but there were no significant relationship between ambivalence and behavioral intentions. Respondents indicated identification with several active roles in the PTD process, including information gathering, weighing pros and cons, persuasion, and support. Answers to open-ended questions indicate a number of motivations for participation. Suggestions for future research in this area are made, and potential clinical implications of the themes arising from the data are discussed. Recruitment challenges are discussed at length and alternative strategies suggested for the involvement of fathers in research about the PTD process.

**41. The Role of Family History and Perceived Heredity in Adolescents' Adaptation to their Mother's Breast Cancer.** Alissa Bovee, Advisor: Barbara Biesecker, MS, 2006. Oral presentation NSGC 2006.

**Abstract**

The diagnosis and treatment of most cancers is a life-altering event for the patient, the spouse, and their children. While only a small percentage of breast cancer is thought to be hereditary, researchers have begun to consider how factors including family history, genetic information, and perceptions of heredity influence the way individuals cope with and adapt to cancer. Although existing research describes the emotional reactions, coping, and adaptation observed among adolescents when a parent has cancer, very little is known about the role of having a family history or perception of heredity in their coping and adaptation process. Lazarus and Folkman (1984) propose a model of stress and coping that suggests an individual's appraisals of a stressful event are important predictors of overall coping and adaptation. Theoretical and empirical data suggest that family history and genetic information influence appraisals of causal attribution, perceived control, and perceived burden. The goal of this study is to examine how a family history of cancer and perceptions of heredity influence personal control, impressions of burden, coping, and adaptation in adolescents whose mothers have had breast cancer.

Participants were recruited from the Mid-Atlantic Cancer Genetics Network (MACGN), the FORCE support group for women at increased risk for cancer due to heredity, and the Y-Me support group for women who have had breast cancer. Families in which a mother has been diagnosed with breast cancer while their child was an adolescent were invited to participate. Mothers were asked to provide family history, genetic, demographic, and diagnostic information. Adolescents were asked to complete a self-administered questionnaire that included measures to assess their causal attributions, perceived control, perceived burden, coping strategies, cancer worries, benefit finding, and distress.

Among the 35 adolescent respondents, the majority were female (71%) and the average age was 18. They were on average 15 when their mother was diagnosed with cancer, and it had been on average 2.8 years since. The average age of the 28 mothers was 48 years, they were largely Caucasian (89%), married (89%) and 61% had genetic testing. Almost all of the adolescents (30/35) had heard about another member of the family having had cancer, and about half reported having interacted with another relative who was affected with cancer. Adolescents causal beliefs about their mother's cancer were predominantly hereditary ( $p=.000$ ), adolescents felt significantly more control over their emotions and relationships than over the symptoms and treatments of cancer ( $p=.000$ ), and used significantly more problem focused coping than disengagement coping ( $p=.001$ ). Their level of distress was similar to a national sample of

adolescents. Multivariate analysis revealed that the use of disengagement coping was predicted by lower perceived control ( $p=.002$ ), and younger age ( $p=.002$ ); that distress was predicted by increased use of disengagement coping ( $p=.000$ ), and increased perceived burden ( $p=.000$ ); that cancer worry was predicted by lower levels of perceived heredity ( $p=.020$ ); and that benefit finding was predicted by increased levels of perceived burden ( $p=.018$ ). There were no significant differences between adolescents with and without a personal experience with cancer with regard to the appraisals, coping, or indicators of adaptation. An adolescent's perceived control and burden predict the type of coping strategies they use, and together, appraisals and coping predict the way they adapt to their mother's breast cancer. Health care provider and group interventions are proposed to enhance control, coping, and benefit finding in this adolescent population.

42. **Genetic Counselors Engaging as Advocates.** Meredith Weaver, Advisor: Joan Scott, MS, 2006. Oral presentation NSGC 2006.

### **Abstract**

Advocacy is considered part of a genetic counselor's scope of practice by the American Board of Genetic Counseling. However, there is little research concerning the nature of advocacy in the genetic counseling profession. Existing advocacy literature in allied health care professions lacks a consistent definition of advocacy, as well as a comprehensive description of the range of activities that are considered advocacy. This study attempts to advance a definition of advocacy within the context of the genetic counseling profession by examining the range of advocacy-related activities described by a sample of genetic counselors.

#### **Methods**

Telephone interviews were conducted with 27 key informants; 17 were initial informants identified prior to the study and 10 were identified by snowball sampling. Initial informants were genetic counselors who have been in practice for many years in a variety of clinical practice settings and thus could comment from an historical perspective on the range of advocacy activities in which the profession has been, and is now, engaged. The study design was qualitative and used a semi-structured, open-ended interview format. The questions explored four domains: (1) advocacy activities in the genetic counseling profession, (2) motivations for engaging in advocacy, (3) challenges to engaging in advocacy, and (4) how advocacy activities, motivations, and challenges have changed over time for either the participant or the profession. Interviews were tape recorded, transcribed verbatim, and coded for analysis.

#### **Results**

The majority of participants defined advocacy as a broad construct with elements of acting on someone's behalf or giving support. Three common advocacy activity themes emerged: (1) offering services, (2) education, and (3) engaging social and political institutions. Participants expressed an overwhelming belief that advocacy was part of the genetic counselor's job. The most commonly expressed challenge to doing advocacy was the lack of resources, support, and time in the health care setting. The most common change over time was that participants' range of advocacy activities had broadened, which some credited to a maturation of their career and professional goals. Motivations for engaging in advocacy were both internal and external, with more participants reporting internal motivations, including high self-expectations to advocate. Finally, the most common person to influence participants to advocate was another professional, such as another genetic counselor, a geneticist, or an administrator.

This study documented the notable finding that advocacy is part of the everyday work of a genetic counselor because participants considered advocacy to be part of their professional role.

This study also illustrated the difficulty participants had in giving concise definitions of advocacy; a working definition of advocacy is put forth based on participants' words. This sample of genetics professionals considered many different activities to be advocacy and many advocacy activities part of daily genetic counselor practice. Participants' motivations for engaging in advocacy were overwhelmingly internal, which suggests an association between the type of person who follows a career in genetic counseling and the type of person who engages in advocacy. The descriptive findings from this study lay the ground work for future research about advocacy in the genetic counseling profession.

43. **Does the general public interpret genetic information about heart disease risk differently than non-genetic information?** Kate Reed, MPH Advisor: Ben Wilfond, MD, 2006. Oral presentation NSGC 2006.

#### **Abstract**

Information about individuals' genetic susceptibility to common disease will be available clinically before treatments specific to certain genotypes have been developed. This study considers whether three sources of risk information about heart disease influence motivation for health behavior change and its precursors differently.

Participants received one of three versions of a questionnaire. Each version contained on vignette about John, who receives risk information about heart disease based on assessment of his diet, family history, or genetic test results. In each vignette, John's risk was 20% above the general population risk. Participants (N=158) were asked what John should think, feel and do about his increased risk.

Participants who received the vignette that based John's risk on family history were significantly more likely to believe he should have high motivation to see the doctor more frequently than were those in the genetic testing group. The source of risk information did not influence the level of motivation for the other types of risk-reducing behavior: avoiding dietary fat and exercising more often. Risk based on family history was also associated with greater likelihood of believing that John should have high self-esteem as it relates to his ability to stay healthy.

These results suggest that risk based on family history may be meaningful to individuals making decisions about health behavior. This may reflect a greater familiarity with family based risk information. Further, risk assessment based on family history does not directly use an individual's genetic make-up or food choices, which may allow individuals to consider risk information more objectively. The current data call into question the assumption that genetic susceptibility information about common disease will lead to significantly greater motivation for health behavior change relative to other, currently available sources of risk information.

*Class of 2005.*

44. **The Range, Origins, and Strengths of Women's Attitudes Toward Amniocentesis.** Julie Sapp, Advisor: Barbara Biesecker, MS, 2005. Poster presentation NSGC 2005 and as a seminar at Kings College London. Published *Prenatal Diagnosis*.

#### **Abstract**

It is generally accepted in the U.S. that amniocentesis is an optional procedure made available to women at increased risk for having a baby with a chromosomal trisomy. Prenatal genetic counseling strives to assist women and their partners in making informed choices. An informed choice is one that is based on an understanding of quality information and is consistent

with the decision-maker's attitudes. The Theory of Reasoned Action (TRA) provides a theoretical framework around which to conceptualize informed choice. According to this theory, a person's behavior is predicted by her behavioral intentions, which are shaped by her attitudes towards the behavior and the subjective norms she perceives to surround the behavior. The purpose of this study is to explore these dimensions of the TRA as they pertain to pregnant women's decision-making about amniocentesis: to gain insight into pregnant women's attitudes toward undergoing amniocentesis, to explore the sources or origins of these attitudes, and to examine important referents that participants have consulted regarding amniocentesis. These objectives were addressed in semi-structured telephone interviews with English-speaking pregnant women 35 years of age or older. Participants between 8 and 16 weeks gestation were recruited from a private prenatal diagnostic center and from ads in a local newspaper. The data generated from these interviews was subjected to coding for thematic analysis. Findings suggest that the majority of participants had ambivalent attitudes toward amniocentesis and considered their partners, friends, and physicians to be important referents when deciding whether or not to have amniocentesis. The implications of this exploratory study include its use as preliminary data for a larger, quantitative study of the components of the TRA as they relate to prenatal testing decision-making.

Sapp JC, Hull SC, Duffer S, Zornetzer S, Sutton E, Marteau T, Biesecker B. Ambivalence toward undergoing invasive prenatal testing: An exploration of its origins. *Prenatal Diag* 2010;30(1):77-82. <http://onlinelibrary.wiley.com/doi/10.1002/pd.2343/abstract;jsessionid=A9D3EC4324968BA4B29D5AD96FECA778.d03t01>

45. **Coping with a Presymptomatic Genetic Test Result for Huntington's Disease.** Sarah Baxter Smith, Advisor: Rajiv Rimal PhD, 2005. Oral presentation NSGC 2005.

### **Abstract**

Research suggests that appraisals of a stressful event, such as the likelihood of change and perceived ability to cope, are important predictors of the use of particular coping strategies and overall adaptation. This study hypothesized that the predominant use of emotion-focused coping over problem-focused coping would be negatively associated with grief scores in individuals having presymptomatic genetic testing for Huntington's Disease (HD).

Surveys were sent to 198 individuals having participated in presymptomatic genetic testing at Indiana University (N=98) and Johns Hopkins University (N=100). Eligibility criteria included individuals who tested negative or positive, and who were without symptoms of HD. Measures included coping self-efficacy, coping strategies, grief experience, exposure to HD, and experiences of undergoing predictive genetic testing.

Among the 83 respondents (41.9% response rate), 63 surveys (45 negative/18 positive result) were eligible for analysis. On average, participants had known their test result for 6 years, were 45 years old, and 63.5% were female. Analysis revealed coping self-efficacy to be negatively associated with the use of avoidance coping ( $p < .001$ ), and avoidance coping to be positively associated with grief scores ( $p < .001$ ). Respondents showed greater use of problem-focused coping strategies compared to emotion-focused strategies ( $p < .001$ ). Problem-focused coping strategies were negatively associated with grief ( $p < .05$ ), while emotion-focused coping strategies were positively associated with grief ( $p < .005$ ).

An individual's coping self-efficacy predicts the use of particular coping strategies which in turn can predict the grief experienced. Genetic Counseling interventions are proposed to maximize

coping self-efficacy and effective coping strategies.

46. **Use of Health Services Among Adults with Intersex Conditions.** Tricia Gasser, Advisor: Colleen McBride, PhD, 2005. Poster presentation NSGC 2005.

**Abstract**

Previous research on individuals with intersex conditions suggests that constrained and secretive disclosure patterns have resulted in feelings of stigmatization and distrust of health care providers. Furthermore, there is theoretical and empirical data to suggest that having high levels of perceived stigma and low levels of trust have a negative effect on health seeking behavior. This study examined the associations between previous disclosure patterns, perceived stigma, trust in health care providers, and current healthcare utilization among adults with intersex conditions. Adults with intersex conditions were recruited from three main sources: support groups, health care providers, and alternative newsweekly advertisements. A total of 74 participants completed a questionnaire that included previously validated measures of perceived stigma, general physician trust, health status, and current health seeking behaviors. The questionnaire also included closed and open-ended items to assess previous disclosure patterns related to their condition and attitudes surrounding that experience. Demographic data was gathered, including participant age, insurance status, and time since receiving a diagnosis. The majority of participants self-identified as female, had private health insurance, and carried a diagnosis of androgen insensitivity syndrome. Participants reported having learned of their diagnosis at a median age of 21 years with a median time since diagnosis of 13 years. Bivariate analyses revealed a significant positive association between evaluation of the disclosure experience and general trust in health care providers. ANOVA showed significant differences in levels of perceived stigma between those who indicated receiving incomplete or inaccurate information from a health care provider about their condition and those who did not. Multivariate analysis revealed general trust in health care providers, having a usual place for seeking care, and overall health rating in the past 12 months to be significant predictors of total health care visits in the past 12 months. Having lower general trust predicted greater number of visits ( $p < 0.05$ ). The results of this study suggest that how individuals learn of their condition may influence later feelings of perceived stigma, trust in health care providers, and use of health services. It is important for health care providers and genetic counselors to understand how disclosure experiences influence these outcomes, and work to incorporate more open and honest communication into disclosure standards. In addition, having lower trust in health care providers may lead to increased use of health services and greater health care costs. Interventions should be developed to increase trust among those with potentially stigmatizing conditions.

47. **An Exploration of Psychiatrists' Management of Genetic Concerns: Implications for the Future.** Marie Cudoc, Advisor: Barbara Biesecker, MS, 2005. Poster presentation NSGC 2005.

**Abstract**

Due to recent developments in psychiatric genetics, the need for genetic counseling for patients with psychiatric disorders will likely increase. Current practices of psychiatrists referring patients for genetic counseling are unknown and there are few guidelines to help psychiatrists determine who should be referred. Thus, the goals of this study were to determine how genetic information and counseling are incorporated into psychiatric sessions and what factors are the best predictors of psychiatrists' behavior related to the genetic concerns of their patients. These

objectives were explored using a questionnaire sent to a representative sample of general adult and child psychiatrists from ten states who are members of the American Psychiatric Association (N=1216). Likert scales and semantic differential scales based upon the Theory of Planned Behavior, clinical vignettes, and open-ended questions were used to assess awareness of genetic issues, attitudes toward referrals, subjective norms, perceived personal control, behavioral intentions, current practices, perceptions of psychiatric genetics, and provider characteristics. There were 480 respondents (40% response rate). Most respondents were male (78%), white (88%), and had been practicing psychiatry for over 20 years (72%). 62% of respondents reported that they frequently or very frequently encounter patients with conditions for which there is a genetic component, but 76% of respondents reported that they referred none of their patients for genetic counseling over the past year. Most respondents (97%) reported that they discuss genetics with at least some of their patients. Yet, the majority (63%) of respondents reported that they do not know the name or contact information for a genetic specialist. Child psychiatrists indicated higher intentions to refer to genetic specialist than general adult psychiatrists ( $p=0.001$ ). Multivariate analyses revealed that attitudes, subjective norms, and perceived personal control were all significant predictors of psychiatrists' intentions to refer and together, they explained 43% of the variance in intentions. Of these three constructs, subjective norms was the best predictor of intentions, accounting for 34% of the variance in psychiatrists' behavioral intentions. Although psychiatrists' indicate a high frequency of encountering patients with genetic concerns, the majority do not regularly refer patients with genetic concerns to genetic specialists. Our results suggest that strategies aimed at changing subjective norms, such as the development of clear written clinical guidelines for psychiatrists about when to make referrals to genetic specialists, may effect the most change in subsequent referral behaviors. Such interventions aim to increase collaboration between psychiatrists and genetic specialties so that both professions are better prepared for helping patients as genetic advances in psychiatry emerge in the future.

*Class of 2004.*

48. **Prognostic Uncertainty and Personal Control: Influences on Parental Coping.** Shawn Sinesky, Advisor: Barbara Biesecker, MS, 2004. Oral Presentation NSGC 2004 and poster presentation NSGC 2004. Published *Am J Med Genet C*

### **Abstract**

Research suggests that appraisals of a stressful event such as a health threat, including perceived uncertainty and personal control, are important predictors of the use of coping strategies. This study explored whether emotion-focused coping is employed more often than problem-focused coping when parents of a child with a chromosome abnormality perceive higher levels of uncertainty and lower levels of personal control over their child's condition. A survey was mailed to 875 parents of the Chromosome Deletion Outreach support group. Measures included the Parental Perception of Uncertainty Scale and the Ways of Coping Checklist-Revised. Perceived control, perceived benefit of the diagnosis and perceived severity of the condition were assessed using Likert-scales, along with collection of sociodemographic data. Open-ended items addressed the experiences of receiving a rare chromosome diagnosis for their child. Among the 363 respondents (41.5% response rate), the majority were female (95%), averaging 37 years of age. Parents waited an average 1.7 years for a diagnosis. Parents' perceived level of uncertainty about their child's condition was greatest in the domains of Unpredictability and Ambiguity. Multivariate analysis revealed lower Perceived Personal Control, Ambiguity, and Lack of Clarity predicted the use of emotion-focused coping ( $p<0.01$ ) while use of problem-focused coping strategies was predicted by

higher perceived personal control, parents' age, child's age, and perceived benefit of diagnosis ( $p < 0.05$ ). A parent's perceived personal control and his/her perceptions of uncertainty do predict the use of coping strategies in adjusting to their child's condition. Genetic counseling interventions are proposed to enhance parental use of effective coping strategies given circumstances that entail a great deal of uncertainty about a child's future.

Lipinski SE, Lipinski MJ, Biesecker LJ, Biesecker BB. *Am J Med Genet C Semin Med Genet*. 2006 Nov 15;142C(4):232-40

[http://www.ncbi.nlm.nih.gov/pubmed/17068805?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/17068805?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

**49. Exploration of Transitional Life Events in Individuals with Friedreich's Ataxia: Implications for Genetic Counseling.** Valerie Brook Waggoner, Advisor: Barbara Biesecker, MS, 2004. Poster presentation NSGC 2004. Published *Am J Neurogenetics*.

#### **Abstract**

Human development across the lifespan is a process of change, adaptation and growth. Throughout this process, key transitional events mark important points in time when one's life course is significantly altered. Awareness of transitional events, brought about or altered by chronic illness and disability, may assist health care providers in recognizing the changing needs of their patients over time. In this qualitative study, perceptions of adults with Friedreich's ataxia regarding transitional events are described. One-time, semi-structured interviews were used to elicit information regarding transitional events and data were analyzed to identify common themes. Adults between eighteen and sixty-five years of age were interviewed (N=42). Overall, Friedreich's ataxia increased the complexity and magnitude of transitional life events. Additionally, events commonly represented significant loss to the individual and presented challenges to his/her self-esteem and identity. Identified transitions were either a direct outcome of Friedreich's ataxia, or a developmental task altered by having the condition. Specifically, an awareness of symptoms, fear of falling and changes in mobility status were the most salient themes from the experience of living with Friedreich's ataxia. Developmental events influenced by the condition were one's primary relationships and life's work. Participants reported using both emotion and problem-based coping strategies during these times of change.

These results, as well as data obtained from participants about experiences with health care providers, help to alert professionals of potentially challenging times in patients' lives, which are subtly or profoundly influenced by chronic illness or disability. Additionally, areas for further research are explored, and implications for developmental counseling approaches, which emphasize key transitional events, are suggested for genetic counseling.

Waggoner B, Leib J, Farmer J, Biesecker B. Exploration of transitional life events in individuals with Friedreich Ataxia: Implications for genetic counseling. *Behav Brain Funct*. 2010 Oct. 27;6(65).

<http://www.behavioralandbrainfunctions.com/content/6/1/65>

**50. Exploring the Value of Health Information to Adult Adoptees.** Karen Tam, Advisor: Sara Hull, PhD, 2004. Oral presentation NSGC 2004.

#### **Abstract**

Adoption creates the legal relationship of parent and child between individuals who are not

each other's biological parent or child. Unlike most individuals, many adoptees do not have access to personal and/or familial health information because of laws and practices that inhibit the disclosure of this information. Lack of access to information, coupled with the increasing consciousness of family history information in health care, brings to light unique challenges that may be associated with being an adoptee-patient. Because this issue has been insufficiently addressed in the research literature, the primary goal of this study was to explore adult adoptees' perceptions regarding the value of personal and familial health information.

Data were collected from 42 adopted individuals, ages 21 to 67 years, using semistructured qualitative telephone interviews. Interviews were tape-recorded and transcribed, and transcripts were imported into QRS-NUD.IST, to facilitate coding and analysis. Data collected suggested several major themes related to: adoptees' motivations for seeking information (including health-related information) about their biological families; their thoughts on the perceived role and importance of familial health information; their experiences not having such information; and their recommendations for improving patient-provider interactions. The desire for health information - a common trigger and motivation leading adoptees' to search for their biological families - appeared to be related to developmental stages in the adult lifespan. Familial health information was seen as useful for a number of reasons, including: to assist in diagnosis, to help predict future health, to understand current symptoms, and as a basis for considering preventative measures. Adoptees described a range of negative feelings, including frustration and anger, when they did not have familial health information. Participants also thought that doctors often avoided the topic of adoption, and that their psychosocial concerns related to being adopted and/or having limited access to familial health information remained unaddressed in health care interactions. Participants raised suggestions to improve the health care of adoptees.

Adoptees in this study demonstrated a practical understanding of the significance and limitations of having familial health information. Further, the experience of having limited access to familial health information plays a role in the complex relationships between searching for birth relatives and notions of kinship, identity, and health. Clinical implications, for primary care physicians and genetics specialists, are discussed in relation to caring for adoptees in the absence of familial health information, and facilitating adoptees' acquisition of it.

#### **51. Adoption of the 2001 ACOG Guidelines for Cystic Fibrosis Testing by Obstetricians.**

Dolphine Blain, MBA, Advisor: Ben Wilfond, MD, 2004. Oral presentation NSGC 2004.

##### **Abstract**

In 2001, 12 years after the gene for cystic fibrosis (CF) was discovered, the American College of Obstetrics and Gynecology (ACOG) published guidelines for CF carrier screening for the pregnant and non-pregnant patients of obstetricians. This foray of genetics into mainstream medicine came as research still showed knowledge deficits in genetics and CF among 16 obstetricians, and an inconsistent pattern of adherence to guidelines. Still, data seemed to indicate an increase in acceptance rates for CF carrier screening in the subsequent year. Little was known, however, regarding the practical details of CF carrier screening administration. The overall objective of this study was to assess the incorporation by obstetricians of the ACOG recommendations for CF carrier screening into routine medical care. A questionnaire was sent to a sample of obstetricians from six different states selected from the American Medical Association (AMA) Physician Masterfile (N = 1,373). The questionnaire assessed the extent to which screening is being offered and agreed to, how pretest education is conducted, how results are communicated to patients, obstetricians' knowledge of CF, and obstetricians' attitudes regarding the guidelines.



This study also determined relationships between these outcomes and other variables, such as demographic characteristics of physicians and attitudes about CF carrier screening. There were 723 respondents, which corresponded to a 61% response rate. There was variation in adherence to specific components of the guidelines. Nearly all obstetricians routinely offered CF carrier screening to patients with a family history of CF (97%) and most offered it to Caucasian pregnant patients (77%); about half (52%) used printed educational materials in conjunction with direct talk, and, when test results come back positive, the majority reported offering to test the patient's partner (92%) and referring the patient to a genetic specialist (76%). Areas of lower adherence included offering testing preconceptionally to non-Caucasian women (39%), using videos for test education (<1%), having the patient sign an informed consent document (35% document at least some of the time that patients agree to testing), and using letters to communicate test results (10% when test results are positive). Test uptake was found to be significantly lower than uptake of CF carrier screening in pregnant populations in previous studies. Approximately half of the respondents estimated that less than 25% of their patients agreed to testing, while earlier studies quoted rates upward of 57%. Malpractice concerns did not appear as a key driver of test offering or consent documentation at this stage, even though it was clearly associated with the level of agreement to these guidelines. Finally, knowledge about CF was good overall, with a few noted areas for improvement. There is evidence that some components of the ACOG guidelines for CF carrier screening have been integrated into regular obstetrics care, but utilization of the test is relatively low. It is unclear the extent to which the guidelines will be followed in the future, what might increase adherence, and how incorporation of the guidelines into obstetrical care will affect the practice of geneticists and genetic counselors.

**52. Causal Attributions and Perceived Personal Control in Caregivers of Children with Autistic Spectrum Disorders.** Danielle Dong, Advisor: Benjamin Wilfond, MD, 2004. Oral presentation at NSGC 2005.

### **Abstract**

The purpose of this study is to determine the association between causal attributions of primary caregivers of children with autistic spectrum disorders (ASD) and their perceived personal control (PPC).

Primary caregivers were recruited through notices to autism-related support groups and advertisements in the Washington Post. Surveys could be completed on the internet or by mailing in a printed version. The survey assessed causal attributions with open-ended questions and the Causal Dimension Scale II, a previously validated measure. The survey also asked about the child's diagnosis, the age of the child at diagnosis, and perceived severity of the child's ASD, and assessed caregivers' levels of PPC over a number of aspects of their child's condition.<sup>17</sup>

There were 196 respondents. The majority were biological mothers (81%) or biological fathers (12%). 86% were caregivers for boys and 12% for girls. The children's diagnoses included Autism (40%), Asperger's syndrome (12%), Pervasive Developmental Disorder-Not Otherwise Specified (25%) and no response (21%).

Respondents expressed a range of causal beliefs including genetics, environmental exposures, and congenital/birth injury. Additionally, caregivers' causal beliefs varied in their level of certainty. On a five-point scale (1= no control and 5= most control), caregivers control over their emotions was 3.0 (+/-0.9), control over their child's treatment and medical care was 3.3 (+/- 0.9), control over their child's symptoms was 2.7 (+/- 0.8), and control over personal relationships in their life was 2.9 (+/- 0.9). Further analysis will investigate the association between causal beliefs and perceived

personal control.

*Class of 2003*

53. **Genetic Counselor's Descriptions of Down Syndrome: Promoting Informed Choice for Prenatal Testing.** Elizabeth Lardy, Advisor: Barbara Biesecker, MS, 2003. Oral presentation NSGC 2003.

**Abstract**

Prenatal diagnosis is offered to pregnant women 35 and older because of their increased risk of having a child with Down syndrome or another chromosomal anomaly. Because there are no standard guidelines as to how Down syndrome should be described in a prenatal genetic counseling session, there may be tremendous variation in counselor's individual practice. 11 Members of the disability and genetic counseling communities have expressed concern that couples are not given a balanced and accurate portrayal of the nature of Down syndrome before prenatal diagnosis, and thus clients are not able to make informed choices about prenatal testing. The purpose of this study was to gain a better understanding of the ways in which Down syndrome is described in prenatal genetic counseling sessions and what factors might influence the description. A qualitative research design was employed to better understand how Down syndrome is described, to assess the type of personal experience prenatal genetic counselors have with people with developmental disabilities, and to describe counselors' attitudes toward Down syndrome. One hundred and sixteen prenatal genetic counselors participated in 15-minute phone interviews. The results suggested that the majority of counselors use a medical description of Down syndrome, most often mentioning mental retardation, facial features, and heart defects. Few counselors mentioned the capabilities of people with Down syndrome, and even fewer mentioned the positive aspects of Down syndrome. Most counselors appreciate both positive and negative aspects of Down syndrome, and believe that people with Down syndrome can have friendships, hold jobs, and go to school, but few point out these abilities in their prenatal descriptions of Down syndrome. This study facilitates understanding of what is said about Down syndrome in prenatal genetic counseling sessions and what factors might influence how Down syndrome is described. It brings into question the information presented to clients for making an informed choice about prenatal testing and has several implications for genetic counseling practice and further research.

54. **Concerns About Genetic Discrimination: Origins and Effects.** Kira Apse, Advisor: Barbara Bernhardt, MS, 2003. Oral presentation NSGC 2003. Published *Genet Med*

**Abstract**

In the midst of extraordinary advances in genetic research, some consumers are afraid to utilize genetic services because of concerns about genetic discrimination. Several public opinion polls and research studies suggest that concerns about the misuse of genetic information by employers and insurers may be widespread. This study explores the nature and extent of consumers' concerns about genetic discrimination as well as the source of such concerns and the resultant impact on utilization of genetic services. A questionnaire was sent to unaffected individuals with a family history of colorectal cancer who had enrolled in the Hereditary Colorectal Cancer Registry of the Johns Hopkins Hospital (N=777). Of the 470 respondents, approximately half rated their level of concern about genetic discrimination as high. Few respondents, 12%, had participated in genetic counseling and 8% had undergone genetic testing. The majority, 68%, had heard of genetic discrimination before receiving the questionnaire of which 79% learned about it

from at least one media source (television, newspapers, magazines and radio). Awareness of legislation regarding genetic discrimination was found to be minimal. Specifically, 88% of respondents were not aware of any federal legislation protecting against genetic discrimination, and 96% did not know if their home state had pertinent legislation. Respondents with a higher level of concern about genetic discrimination were significantly less likely to consider meeting with a healthcare professional to discuss genetic testing or to undergo testing. In addition, if they were to pursue genetic testing, those with a higher level of concern would be significantly more likely to pay out of pocket, use an alias or ask for test results to be excluded from their medical record. Findings from this study demonstrate the negative effect of concerns about genetic discrimination on interest in and decisions about utilization of genetic services. Stronger legislative protections against genetic discrimination and increased public education through the scientific community and media sources are needed.

Apse K, Biesecker B, Giardiello F, Fuller B, Bernhardt B: Perceptions of Genetic Discrimination Among At-Risk Relatives of Colorectal Cancer Patients *Genet Med* 2004 Nov-Dec;6(6):5106  
[http://www.ncbi.nlm.nih.gov/pubmed/15545747?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15545747?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

**55. Asking Fathers: A Study of Psychosocial Adaptation Among Fathers Boys with Hemophilia.** Erin Herrick, Advisor: Lawrence Wissow, PhD, 2003. Oral presentation NSGC 2003 and International Hemophilia Foundation Conference 2004. Published in *Haemophilia*

#### **Abstract**

In the scope of research involving families with children who have chronic illnesses or special needs, paternal responses are generally lacking, and often combined with maternal responses to reflect overall parental functioning. While such data are useful in providing anticipatory guidance for couples, they tell us little about the unique needs of fathers. This study aimed to explore the psychosocial adaptation of fathers who have boys with hemophilia. A questionnaire was sent to fathers recruited from hemophilia support organizations in Maryland, Virginia, Pennsylvania and the D.C. area (N = 320). Quantitative measures included the Perceived Sense of Parenting Competence (PSOC), and the Locke-Wallace Marital Adjustment Test (MAT). Qualitative items addressed the challenges of rearing a son with hemophilia, barriers to father's involvement, and how their son's diagnosis has changed their life. Among the 83 eligible respondents, MAT and PSOC scores were significantly correlated ( $p < .01$ ), indicating a relationship between adaptation in marriage and in parenting. Neither socio-demographic variables, nor medical characteristics of the boys were significant. Rather, psychosocial variables such as feeling "left out" of decision making regarding their son's care by their wife or by medical staff, worry about infection and limited activity, and not being able to give infusions significantly and negatively affected perceptions of parenting satisfaction, efficacy, and marital adjustment. Qualitative responses provided further support for quantitative findings. A more proactive attempt to include and engage fathers is warranted by all members of the healthcare team. Suggested educational interventions include more frequent discussions of inheritance and recurrence risks, and creating opportunities for hands-on practice giving infusions. Psychosocial interventions include: Asking fathers about and addressing their questions and concerns; providing anticipatory guidance on the importance of shared decision-making and paternal involvement in care, which may benefit marital adjustment, parenting sense of efficacy and satisfaction, as well as the child's adaptive outcome; and offering referrals to support groups and counseling services. As culture and

medicine have advanced together, it is time to challenge some of the assumptions that have reinforced fathers' absence from the clinical setting and contributed to their minority status in social science research.

Herrick EK, Nussbaum R, Holtzman NA, Wissow L. Asking fathers: a study of psychosocial adaptation. *Haemophilia*. 2004 Sep;10(5):582-9  
[http://www.ncbi.nlm.nih.gov/pubmed/15357787?ordinalpos=5&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15357787?ordinalpos=5&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

56. **Japanese People in the U.S. Their Needs and Attitudes toward Prenatal Genetic Counseling.** Chieko Tamura, Advisor: Debra Roter, DrPH, MPH, 2003. Poster presentation NSGC 2003.

#### **Abstract**

Genetic counseling, as practiced in the United States for over 30 years, has been based mainly on Western cultural values. Yet, the need for genetic counseling services in different sociocultural settings has been increasing. This study was designed to understand the needs and attitudes toward prenatal genetic counseling of people with a Japanese cultural background. Three focus groups were held with Japanese women between 20 and 45 years of age, who had come to the US after turning 20 years old. Participants were asked about their needs and expectations toward prenatal general counseling, their social and familial support systems associated with their decision-making process, their thoughts and cultural views toward pregnancy and prenatal diagnosis, and their attitudes toward psychological counseling. Focus group data has been analyzed to identify themes related to needs and attitudes. The result shows that these women are interested in prenatal genetic counseling, and want to obtain as much information related to prenatal diagnosis as possible. Additionally, participants indicated that psychological counseling would be helpful for them. However, some suggested that they would like to know that genetic counseling sessions consist of not only information provision but also psychological counseling, prior to actual sessions, so that they could prepare to discuss medical issues as well as psychosocial concerns. Most of these women believe that the decision related to prenatal diagnosis should be made primarily by the couple. These women identify strongly with their Japanese cultural background, but do not want genetic counselors to treat them differently because of their background. The findings of this study will have implications for the delivery of prenatal diagnosis and genetic counseling services that take into account the needs of people who are living in the US and have a Japanese cultural background. The findings of this study will also be used to make suggestions for the future direction of prenatal genetic counseling practice in Japan.

*Class of 2002.*

57. **Spirituality and its Inclusion in U.S. Genetic Counseling Practice.** Jessica Sparrin, Advisor: Gail Geller, ScD, 2002. Oral presentation NSGC 2002.

#### **Abstract**

For the vast majority of the general population, spirituality plays a prominent role in decision-making, coping and adaptation. Genetic counseling often brings individuals or couples into a situation where their religious and spiritual beliefs come to the forefront. Whether the reason for referral is genetic testing, prenatal diagnosis or the continuing care of an affected individual, by

the very nature of the topics discussed, clients will often examine their personal morals and values. It is during this exploration that genetic counselors may encounter individuals' spiritual beliefs or religious convictions. However, very little is known about how genetic counselors respond both professionally and personally to this topic when it arises, or the degree to which counselors initiate such discussions. In order to fill this gap, a descriptive survey was sent to 1075 genetic counselors practicing in the U.S. 45% (N=477) responded. Although 18% of respondents say they "frequently" inquire about their clients' religious beliefs, 57% (N=234) of those who inquire do so to discuss the increased genetic risks associated with Ashkenazi Jewish descent. Four percent of respondents say they "frequently" discuss spirituality and 2.8% say they "frequently" inquire about the spiritual beliefs of their clients. Most commonly, such discussions focus on the clients "sources of support" and methods of "coping," (68.3% and 60.2%, respectively). Belief about "spiritual care" as the role of a genetic counselor ( $p < 0.01$ ) and comfort level with the topic ( $p < 0.01$ ) are the best predictors of a counselor's willingness to inquire about the spiritual beliefs of their clients. Respondents also provide their recommendations for future training needs including an overview of belief systems and techniques for initiating discussion about spirituality and religion.

58. **Genetics and Alcoholism: Beliefs and Behaviors of At-Risk Relatives.** Jennifer Gamm, Advisor: Barbara Biesecker, MS, 2002. Oral presentation NSGC 2002. Published in *Am J Med Genet A*

#### **Abstract**

There is evidence that genetic factors can influence a person's risk for developing alcoholism. Yet, the extent to which people recognize the existence of these factors and integrate this information into their own belief systems is unknown. In other disorders with a hereditary component, there is evidence that a belief in a genetic etiology may lower an individual's perceived personal control or lead to a fatalistic outlook that may adversely affect behavior. The purpose of this study was to explore the beliefs concerning etiology of alcoholism, specifically beliefs about the role of genetics, among individuals whose families have been affected by alcoholism. Additionally, we (I) explored the relationships between these beliefs and individuals' feelings of personal risk and perceived control related to alcoholism, and we (did you decide to revert to we?) investigated the level of interest in possible future predispositional genetic testing. In-depth interviews were conducted with 27 individuals who had at least one first-degree relative affected with alcoholism. The interviews revealed that participants attribute multiple factors to the cause of alcoholism in their families, and that these factors are combinations of biological, genetic and environmental influences, as well as personal characteristics. The perception of being at-risk most often stemmed from a belief in a genetic or biological etiology for alcoholism, while participants' strong sense of personal control was associated with beliefs in environmental or personal characteristics that differed between them and their alcoholic family member. Among the interviewees, interest in genetic testing for susceptibility to alcoholism was moderate, and anticipated reactions to testing did not support the concept that fatalism is at work in this population. The various beliefs that individuals hold concerning the etiology of alcoholism, their feelings about risk, and their sense of perceived control are all important issues for patients behaviorally and psychosocially. Professionals should be aware of these beliefs and the possible relationships among them.

Gamm J, Nussbaum R, Biesecker B: Genetics and Alcoholism Among At-Risk Relatives I: Perceptions of Cause, Risk, and Control *Am J Med Genet* 128A(2):144-150, 2004.

[http://www.ncbi.nlm.nih.gov/pubmed/15214005?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15214005?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) .

Gamm J, Nussbaum R, Biesecker B: Genetics and Alcoholism Among At-Risk Relatives II: Interest and Concerns about Hypothetical Genetic Testing for Alcoholism Risk. *Am J Med Genet* 128A(2);151-155, 2004.

[http://www.ncbi.nlm.nih.gov/pubmed/15214006?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15214006?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

59. **Language Interpreters in Genetic Counseling.** Jane Peredo, Advisor: Barbara Bernhardt, MS, 2002. Oral presentation NSGC 2002.

### **Abstract**

Increasingly, in the United States, persons with limited or no English proficiency are seeking medical care, including genetic counseling services. Thus, a language barrier is likely to exist when this population seeks genetic counseling services. Given its client-centered approach with an emphasis on patient autonomy about decision-making regarding genetics and the impact of that information on one's life, communication is integral to genetic counseling. This study addresses the extent to which language interpreters are needed and utilized in genetic counseling, and genetic counselors' satisfaction with interpreters. Genetic counselors (N=711) working in states where persons with limited English proficiency are presumed to reside were asked to complete a questionnaire about the need and utilization of interpreters in this setting. In addition, factors that influence decision-making about requesting a trained interpreter were explored. This study found that persons with limited or no English proficiency comprise, on average, 21.3% and 12.7%, respectively, of clients seeking genetic counseling services. When encountering a language barrier, genetic counselors use ad hoc interpreters twice as often as trained interpreters. However, use of trained interpreters in genetic counseling is higher than previously reported in the medical setting. Although trained interpreters are available to approximately 60% of genetic counselors, their ability to speak another language, the convenience of recruiting an ad hoc interpreter, the administrative burden of locating a trained interpreter, cost, having one's request bumped by another clinician and satisfaction with ad hoc interpreters were identified as barriers to the utilization of trained interpreters.

60. **Newborn Screening for Duchenne Muscular Dystrophy.** Nicole Johnson, Advisor: Neil Holtzman, MD, 2002. Oral presentation NSGC 2002.

### **Abstract**

Duchenne muscular dystrophy (DMD) is an X-linked genetic disorder that often results in death within the third decade of life. DMD is a relatively common disorder affecting approximately 1:3500 live born males. There is currently no cure for DMD and medical intervention primarily focuses on supportive care. Technology was developed in the mid-1970's that would allow the identification of newborns who would eventually develop the symptoms associated with DMD. Between the years of 1985 and 1997, 58 males were identified with muscular dystrophy through a Western Pennsylvania pilot newborn screening project. The experience of the parents of the children identified, and how the presymptomatic information affected their families, was explored with parents from this pilot screening program. Seventeen parents, from twelve families, completed a semi-structured interview. These seventeen parents, along with two who did not

participate in the interview, completed a questionnaire that assessed fifteen areas of family functioning such as overprotection, integration into the family and limits on family opportunity. The interviews were analyzed for common themes that emerged from the parents' experiences. Parents perceived the presymptomatic diagnosis as beneficial for: helping to emotionally prepare themselves and their family prior to their son's own awareness of his disorder, time to prepare their house for a handicapped child, and for planning reproductive decisions. Seven out of the twelve families stated that they changes their original reproductive plans based on knowing their son's diagnosis. Negative aspects of screening centered around the diagnostic process in which parents first learned of their son's potential diagnosis of muscular dystrophy. Some parents experienced feelings of detachment or interference with bonding as a result of learning their child's diagnosis during the neonatal period. Scores on the family functioning questionnaire indicate that families of ambulatory children diagnosed through neonatal screening tend to have a level of stress more similar to families of non-ambulatory children than families of ambulatory children that received a clinical diagnosis. While all families believed that learning their son's diagnosis prior to a later clinical diagnosis was beneficial, some of the families believed that the neonatal period was too soon for an early diagnosis. In the absence of pre-symptomatic clinical trials for treatment of muscular dystrophy, heightened awareness about the early signs and symptoms of muscular dystrophy for pediatricians and the general public may be a better alternative to addressing the problem of diagnostic delay than neonatal screening for muscular dystrophy. Prior to implementation of potential future pilot neonatal screening programs, particularly for presymptomatic and untreatable conditions, protocols should be developed that create the best possible approach for pediatricians to disclose results to parents. Genetic counselors familiar with the condition should be involved with the initial disclosure and available to families on both an immediate and long-term basis after they receive their child's screening results. In addition, pilot neonatal screening programs should remain optional and include an evaluative component to monitor and assess parents' experiences so that programs can be modified and/or discontinued in response to their experiences.

*Class of 2001.*

**61. Why do Fertile Couples Choose Preimplantation Genetic Diagnosis: An Exploratory Study.** Jennifer Leib, Advisor: Barbara Biesecker, MS, 2001. Poster presentation NSGC 2001.

### **Abstract**

In preimplantation genetic diagnosis (PGD), a couple uses in-vitro fertilization (IVF) to create embryos, and then one cell is removed and genetically tested. Unaffected embryos are then transferred to the woman's uterus. The possibility of misdiagnosing the embryo, the medical risks for the women, the low pregnancy rates and the financial cost of participating in PGD would all seem to deter a fertile couple who would not ordinarily participate in IVF from choosing PGD. Fertile couples may even be further deterred in that they are making the decision to engage in PGD in the presence of less risky, less expensive and more successful options, namely prenatal diagnosis, donor gametes and adoption. This study investigated the decision-making process of fertile couples who have had PGD, including the factors, beliefs and experiences that lead a couple to choose PGD over other options. An exploratory approach of qualitative research methods was used to analyze the data collected through semi-structured telephone interviews. The decision-making process to engage in PGD was found to be minimal. When specifically probed about other options, they described choosing PGD over prenatal diagnosis because of their discomfort with abortion. The majority of the sample reached this decision without

any prior experience with prenatal diagnosis and a pregnancy termination. They chose PGD over the options of donor gametes and adoption based on their strong desire to be genetically related to their children. The impact of the genetic condition on the family and on the affected individual's life also served as a strong motivator to pursue PGD. An additional factor in their decision to participate in PGD was found to be the accessibility of PGD. Thus, when their attitudes and beliefs eliminated other reproductive options, the impact of the condition further motivated these fertile couples to gain access to PGD. This study generated several implications for genetic counselors, including the need to increase access to this new technology for their clients, the development of educational and supportive materials on PGD and the need to incorporate the impact of the genetic condition on the family in their counseling agenda.

**62. The Decision to Continue: The Experiences and Needs of Parents who Receive a Prenatal Diagnosis of Holoprosencephaly.** Krista Redlinger Grosse, Advisor: Barbara Biesecker, MS, 2001. Oral Presentation NSGC 2001. Published in *Am J Med Genet*

### **Abstract**

Holoprosencephaly (HPE) is a condition characterized by a defect in the midline of the embryonic forebrain. When found prenatally, the diagnosis of HPE offers parents a poor but often uncertain prognosis for their baby. Previous studies have examined the psychological and social impact of abnormal prenatal diagnostic on parents. Because the majority of parents receiving abnormal prenatal results terminate their pregnancies, studies have yet to examine parents' experiences and needs throughout their decision to continue a pregnancy.

This study explored this issue by interviewing twenty-four parents who received a prenatal diagnosis of HPE and continued their pregnancy. Parents were asked about the process of their decision making to continue the pregnancy and their needs throughout that process. The interviews were analyzed qualitatively for common themes that emerged from the parents' experiences.

It was found that most parents did not make an active decision about continuing the pregnancy. Rather, parents described a more subtle, passive decision that evolved over time and consisted of several factors. These factors included the parents' religious background, personal beliefs, past experiences, and the uncertainty involved in the diagnosis of HPE. Parents also discussed many coping strategies that factored into their decision. In addition, they described their informational, emotional, and supportive needs throughout the process of decision making. Specifically, these needs stemmed from experiences with health care professionals that were both not helpful and helpful. These factors all contributed to the evolution of parents' decision to continue the pregnancy and their eventual adaptation and acceptance of their decision. The clinical and research implications of these results for the field of genetic counseling are discussed.

Redlinger-Grosse K, Bernhardt BA, Berg K, Muenke M, Biesecker BB. The decision to continue: the experiences and needs of parents who receive a prenatal diagnosis of holoprosencephaly. *Am J Med Genet.* 2002 Nov 1;112(4):369-78.

[http://www.ncbi.nlm.nih.gov/pubmed/12376939?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/12376939?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)



**63. Stigma, Culture and the Genetics of Schizophrenia: The Family Member's Perspective.**

Robin Cohen, Advisor: Gail Geller, ScD, 2001. Oral presentations at the American Public Health Association's Annual Conference and at NSGC 2001.

**Abstract**

The purpose of this study was to identify and describe family members' perceptions of schizophrenia in a climate in which there is increasing evidence for a genetic contribution to the etiology of this condition. This study addresses three primary research questions:

(1) What do family members understand about and expect from genetic research related to schizophrenia? (2) How do family members think the discovery of a gene related to schizophrenia will influence the nature and degree of stigma associated with this illness? (3) Are responses to genetic research influenced by cultural factors?

The power of molecular genetic tools is accelerating the process of understanding schizophrenia at a biological level. Despite the fascinating contribution these findings may be making to science, it is critical to understand their impact on families with schizophrenia since they will be the direct recipients of scientific knowledge and clinical interventions that may evolve from this work. It is essential that scientists and families work together to ensure that emerging genetic information is understood, disseminated, and utilized in a manner that best meets families' needs. This can be facilitated by including family members in empirical research about their expectations and perceptions of the role of genetics in schizophrenia.

*Class of 2000*

**64. Experienced and Anticipated Stigma and Coping Responses in Children with**

**Neurofibromatosis Type I and their Unaffected Siblings.** Lisa Pike-Buchanan, Advisor: Barbara Bisesecker, MS, 2000. Oral presentation NSGC 1999.

**Abstract**

No research studies have yet been completed that investigate the stigma experience and coping responses in children with neurofibromatosis type 1 (NF1) or their unaffected siblings. Information gained from this investigation will allow a counselor to anticipate concerns about, and potential effects of, stigma and to explore effective ways of coping with them for a particular child or unaffected sibling. It is particularly important to begin facilitating the coping process during childhood, given some of the enduring psychosocial detriments living with NF1 may present.

Using a qualitative approach, we interviewed eleven children with NF1 and eleven unaffected siblings of children with NF1 between the ages of 7 and 17 years. Themes were identified within the six dimensions of stigma, including origin, aesthetic qualities, concealability, course, peril and disruptiveness. The two most significant dimensions contributing to the stigma experience of these children were concealability and disruptiveness. The themes that emerged from the concealability dimension were covering the physical stigmata, passive concealment of the diagnosis, and active concealment of the diagnosis through secrecy. Significant themes that materialized from the disruptiveness dimension were teasing, ability to form and maintain friendships, learning disabilities, diminished involvement in sports activities, and pain. Visibility of stigmata is a more meaningful predictor of the stigma experience than severity. Stigma, whether experienced or anticipated, was found to some degree in all of the affected participants. With one exception, the unaffected siblings did not experience or anticipate courtesy stigma.

Themes were also recognized within the three categories of coping responses to a stigmatizing event, including those with attempt to: 1) prevent the event by changing the situation

around it; 2) change the meaning of the event; and 2) control stress after the event has happened. The coping mechanism utilized most often by this study population involved an attempt to prevent the stigmatizing event from happening by changing the situation around it, which coincides with the concealability dimension of stigma. A strong need for social support from other children with NF1 was identified in the affected children. Implications for genetic counseling and areas for future research are discussed.

**65. Genetic Testing for Breast Cancer Susceptibility: A Qualitative Assessment of Black Women's Attitudes.** Grace-Ann Olayinka-Fasaye, Advisor: Barbara Bisesecker, MS, 2000. Oral presentation NSGC 2000.

#### **Abstract**

Black women are less likely to undergo genetic testing for breast cancer susceptibility and are poorly represented in genetic counseling testing research. To understand this, qualitative methods were used to assess health beliefs and practices of twelve Black women with a family history of breast cancer. A semi-structured interview guide was used to elicit insights into how 4 health beliefs influence attitudes toward genetic testing for breast cancer risk. The women received regular breast cancer screening and believed breast cancer could be effectively treated. All of the women spontaneously referred to spirituality when describing their health beliefs. Most women were uncertain about the causes of breast cancer but felt that they could reduce their chances of getting breast cancer by taking care of themselves. None of the women would consider prophylactic mastectomy because of their belief that other effective methods exist for prevention. Most women acknowledged that breast cancer can be hereditary but did not feel that it was running in their family. Nine of the twelve women were hypothetically interested in genetic testing. Perceived advantages of testing included getting a complete understanding of their risk, reassurance and relief from uncertainty. Women believed a positive test result would encourage them to monitor their breasts more carefully, and motivate them to urge their relatives to monitor their breasts aggressively and to get genetic testing. Perceived disadvantages of testing included the inconvenience of having to make several trips for testing, dislike of needles, stress associated with a positive result and believing that the test offers no guarantees that breast cancer will not occur, no matter what the test result. Women would prefer to have their physician approach them about genetic testing and would like testing to be performed with other routine blood work or when they receive their mammograms. This research suggests reasons that Black women may see potential personal value of genetic testing. Measures need to be taken to ensure that Black women are aware of the availability of testing. Genetic counseling with Black women should be individualized to facilitate an exploration of the impact that their perceptions have on their decision to have to decline testing.

**66. Analysis of Referrals for Prenatal Genetic Counseling: Recommendations for Delivery of Genetic Services and Implications for Genetic Counseling.** Carrie Mastromarino, Advisor: Barbara Bernhardt, MS, 2000. Oral presentation NSGC 2000. Published in *J Genet Couns*

#### **Abstract**

Physicians and other health care providers serve as gatekeepers for the majority of genetic counseling clients. Yet few studies have been conducted to assess if or why obstetric providers refer their patients to prenatal genetic counseling. Further, it is unknown what patients are told about genetic counseling by those who refer them. Previous research suggests genetic

services are underutilized, and ambiguity exists among non-genetics providers about what constitutes genetic counseling. This study utilized secondary data to examine aspects of the referral made to prenatal genetic counseling. Audiotapes were available from the first prenatal visits of a total of 104 patients with forty-five providers (24 obstetricians and 21 certified nurse-midwives).

Seventy-two visits were with actual patients and 32 visits were with a simulated patient.

Thought all patients had indications for being offered genetic services, the simulated patient was considered at higher risk than were most actual patients. Content analysis was performed on transcripts of these visits to document the circumstances under which patients do and do not get referred as well as to provide information about what actually occurs during a discussion about 5 genetic counseling. Finally, interviews with 23 of these obstetric providers were analyzed to help interpret what was observed in the prenatal visits.

Findings indicated that most actual patients were not referred to genetic counseling, while the simulated patient usually was referred to genetic counseling. Second, when genetic counseling was discussed, minimal description of the service was provided. Variance in how genetic counseling was discussed may be explained, in part, by different characteristics of the actual and simulated patients, such as degree of genetic risk and interest in prenatal diagnostic testing. In addition, data from interviews with providers revealed that providers refer less often than they say they refer, but that their perceptions of genetic counseling generally match how they discuss the service with patients. These data prompt specific recommendations for the obstetric community about referring patients for genetic counseling and what to tell patients about this service. In addition, Implications of these findings for the field of genetic counseling are addressed.

Bernhardt B, Mastromarino C, Roter D, Geller G, How do Obstetric Providers Discuss Referrals for Prenatal Genetic Counseling? *J Genet Couns* 2005 Apr;14(2):109-17.

[http://www.ncbi.nlm.nih.gov/pubmed/15959642?ordinalpos=206&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15959642?ordinalpos=206&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

**67. Development of a Patient Activation Intervention and Assessment of the Feasibility of its Use in a Study of Prenatal Genetic Counseling Clients.** Melissa Barber, Advisor: Barbara Bernhardt, MS, 2000. Oral presentation NSGC 2000.

### **Abstract**

Genetic counseling represents the opportunity for clients to have their informational and psychosocial needs addressed by the counselor. Studies have indicated that genetic counseling sessions may not be addressing all of a client's psychosocial needs. The aims of the study were to develop and revise a patient activation intervention tool and to assess the feasibility of conducting future studies to evaluate it. A health education model was used to develop an intervention aimed at increasing client participation in genetic counseling by addressing factors known to effect participation. Qualitative data concerning the design and use of the intervention and the feasibility of assessing its effectiveness with genetic counseling clients were collected from genetic counseling clinic staff (n=14) and genetic counseling clients (n=16). The findings from this study led to a revised version of the patient activation intervention tool that takes into account most of the concerns and suggestions made by the research subjects. The intervention is a two-sided document that includes a brief introductory paragraph about prenatal genetic counseling, a chart for clients to indicate their questions and concerns, and a statement emphasizing the importance of their preparation in their genetic counseling session. We found that while genetic counselors were

somewhat hesitant about exposing their clients to the intervention because it might lead to increased anxiety, the clients felt that having something like it prior to their counseling sessions might have helped them be better prepared for their session.

68. **Discussions of Personal Meaning in Pre-Amniocentesis Genetic Counseling.** Lori Hamby, Advisor: Debra Roter, DrPH, MPH, 2000.

**Abstract**

The information that women and couples learn during prenatal genetic counseling has relevance beyond the information itself. People process such information in terms of the personal meaning that it has for them. In order to learn more about the way discussions of personal meaning unfold during prenatal genetic counseling sessions and the factors that effect their inclusion, I conducted an exploratory qualitative study of the effect of the beliefs of prenatal genetic counselors on their counseling practices and the fulfillment of client needs. The study involved interviews with seven prenatal genetic counselors from four prenatal genetics centers about their 6 general approaches within pre-amniocentesis genetic counseling sessions with these prenatal genetic counselors and their clients, and eleven interviews with a sub-set of the participating clients.

The combined analysis of these three sets of data provide preliminary evidence that there is discrepancy between genetic counselors' plans and practices as well as clients' desires and needs. The audio-taped sessions show variation in terms of the frequency and depth of such discussions in actual practice. In addition, the clients in this study expressed mixed feelings concerning their preferences for discussing personal meaning with their genetic counselors. The implications for the practice of genetic counseling, the training of genetic counselors and needs for future research are discussed.

*Class of 1999.*

69. **What Happens During the Prenatal Genetic Counseling Session: Exploratory Study of Genetic Counseling.** Yelena Kemel, Advisor: Debra Roter, DrPH, MPH, 1999. Oral presentation NSGC 1999.

**Abstract**

To gain better understanding of communication between genetic counselors and patients, we conducted an exploratory study of the communication process in genetic counseling encounters in the context of prenatal diagnosis. This study examined the content, structure and patient satisfaction of prenatal diagnostic consultations of patients referred to genetic counseling centers following an abnormal triple screen result. Data were collected at two prenatal diagnostic centers in the Baltimore/Washington area. Ten genetic counseling sessions conducted by five genetic counselors from these two prenatal diagnostic centers were audiotaped, transcribed, and analyzed for content using the Roter Interaction Analysis System and qualitative content analysis. Patient satisfaction was measured by an exit questionnaire. The consultations were dominated by biomedical information exchanges. The amount and nature of information provided by the counselors was very similar between different sessions and consistent with published report on the content of prenatal genetic counseling sessions. Some of the areas where the most variability was observed included decision-making discussions, psychosocial discussions, and discussions of the outcomes of testing. The relevance of these findings for clinical practice and training of genetic counselors, as well as directions for future research are discussed.

70. **Perceptions of Reproductive Risk and Carrier Testing among Adolescent Sisters and Parents of individuals with Chronic Granulomatous Disease.** Cynthia James, Advisor: Neil Holtzman, MD, 1999. Oral presentation NSGC 2000. Published in *Am J Med Genet*

**Abstract**

Although substantial research has investigated the impact of having a sibling with a chronic disease, little is known about how genetic etiology influences an adolescent sibling's experience, impeding the provision of effective genetic counseling. To explore adolescent sisters' (1) perceptions of their reproductive risks, (2) resources for information and support, and (3) attitudes toward the appropriate age for, and risks and benefits of, carrier testing, we interviewed 14 parents and 9 sisters (ages 12-15) of males with Chronic Granulomatous Disease (CDG), a primary immunodeficiency disorder inherited in both an X-linked recessive and autosomal recessive manner. The semi-structured telephone interviews were audiotaped, transcribed, and subjected to template analysis (a common qualitative methodology). Girls were all aware that CGD is a heritable condition and each had made an assessment of her reproductive risk. All of the girls considered their parents to be their best source of information and support. However, girls 2 sometimes had trouble initiating discussions for fear of upsetting their parents. Girls commonly favored carrier testing at a later age than their parents. Even the girls who favored carrier testing for minors expressed more concerns about psychological risks associated with testing than did their parents. 4/14 parents considered childhood carrier testing necessary, believing it is a parents' responsibility to obtain medical information and emotionally beneficial for a child to grow up with it. 9/14 parents advocated carrier testing during adolescence based on concerns about their child becoming sexually active. All girls and parents believed eventual carrier testing was vital because of its relevance to reproductive decision-making and relationship-building. This study provides insight into the experiences of families with X-linked and autosomal recessive CGD, which may have relevance for other X-linked and autosomal recessive conditions. We found that adolescent sisters think about their reproductive risks and develop opinions about carrier testing and want to discuss these issues with their parents, but have trouble initiating conversations. Therefore, including adolescent sisters in family-based genetic counseling would be beneficial. Further research is needed to determine effective ways to aid adolescent siblings in thinking about their reproductive risks and options for carrier testing and to facilitate communication within families about these issues.

James CA, Holtzman NA, Hadley DW. Perceptions of reproductive risk and carrier testing among adolescent sisters of males with chronic granulomatous disease. *Am J Med Genet.* 2003 May 15;119C(1):60-9.

[http://www.ncbi.nlm.nih.gov/pubmed/12704639?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/12704639?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

71. **Parental Attitudes Towards a Diagnosis in Children with Unidentified Multiple Congenital Anomaly Syndromes.** Eric Rosenthal, PhD, Advisor: Barbara Bisesecker, MS, 1999. Oral presentation NSGC 1999. Published in *Am J Med Genet*

**Abstract**

Approximately 1% of newborns are affected with multiple birth defects, and in over half of these cases it is impossible to identify a specific syndrome to explain the pattern of anomalies.

Although genetics clinics provide care for many children with unexplained congenital anomaly syndromes, very little is known about the ways in which the lack of a diagnosis affects parents. We undertook an exploratory investigation of this phenomenon by interviewing twenty-nine parents of sixteen children born with an unidentified multiple congenital syndrome in order to learn more about their attitudes towards diagnostic information. The parents in our sample had all been aware of their child's birth defects for between 2 and 23 years, and they had all sought multiple evaluations in an attempt to find a diagnosis that could explain their child's condition. Since our sample was selected from a pool of parents who had already demonstrated an interest in diagnostic information it was not surprising that most of them told us that they remain interested in identifying their child's syndrome. Typically, they told us that they had been especially anxious to obtain a diagnosis when the child was younger, but their interest has diminished to varying degrees with the passage of time.

Using qualitative methodology, we identified six general areas where parents felt that a diagnosis would have a significant impact: Labeling, Causes, Prognosis, Treatment, Acceptance, and Social Support. Some of the most significant issues revolved around obtaining special education services, knowing what to expect in the child's future, watching out for new problems, fears about the child's life-expectancy, concern about recurrence risks, and a desire to make sure that the child was receiving appropriate treatment. We discuss these results in relation to clinical practice and suggest areas for further research.

Rosenthal ET, Biesecker LG, Biesecker BB. Parental attitudes toward a diagnosis in children with unidentified multiple congenital anomaly syndromes. *Am J Med Genet.* 2001 Oct 1;103(2):106-14. [http://www.ncbi.nlm.nih.gov/pubmed/11568915?ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/11568915?ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

## STUDENT PUBLICATIONS IN CHRONOLOGICAL ORDER

- D'Amanda CS, Peay HL, Wheeler AC, Turbitt E, Biesecker BB (2019) Fragile X syndrome clinical trials: exploring parental decision-making. *J Intellect Disabil Res* (Epub ahead of print).  
<https://www.ncbi.nlm.nih.gov/pubmed/30747463>
- Fiallos K, Owczarzak J, Bodurtha J, Beatriz Margarit S, Erby L (2019) Where culture meets genetics: Exploring Latina immigrants' lay beliefs of disease inheritance. *Soc Sci Med* (Epub ahead of print)  
<https://www.sciencedirect.com/science/article/pii/S0277953619300978>
- Bell M, Biesecker BB, Bodurtha J, Peay HL (2019) Uncertainty, hope, and coping efficacy among mothers of children with Duchenne/Becker muscular dystrophy. *Clin Genet* (Epub ahead of print)  
<https://onlinelibrary.wiley.com/doi/full/10.1111/cge.13528>
- Kumar N, Turbitt E, Biesecker BB, Miller IM, Cham B, Smith KC, Rimal RN (2019) Managing the need to tell: Triggers and strategic disclosure of thalassemia major in Singapore. *Am J Med Genet A*. (Epub ahead of print)  
<https://www.ncbi.nlm.nih.gov/pubmed/30821068>
- Hellwig LD, Biesecker BB, Lewis KL, Biesecker LG, James CA, Klein WMP (2018) Ability of patients to distinguish among cardiac genomic variant subclassifications. *Circ Genom Precis Med*. Jun;11(6).  
<https://www.ncbi.nlm.nih.gov/pubmed/29848613>
- Haakonsen Smith C, Turbitt E, Muschelli J, Leonard L, Lewis KL, Freedman B, Muratori M, Biesecker BB. (2018) Feasibility of coping effectiveness training for caregivers of children with autism spectrum disorder: A genetic counseling intervention. *J Genet Couns*. Feb;27(1):252-262. <https://www.ncbi.nlm.nih.gov/pubmed/28879629>
- R Shapira, E Turbitt, LH Erby, BB Biesecker, WMP Klein, GW Hooker (2018) Adaptation of couples living with a high risk of breast/ovarian cancer and the association with risk-reducing surgery. *Familial Cancer*, 17(4): 485-493.  
<https://link.springer.com/article/10.1007/s10689-017-0065-z>
- Umstead KL, Kalia SS, Madeo AC, Erby LH, Blank TO, Visvanathan K, Roter DL. (2018) Social comparisons and quality of life following a prostate cancer diagnosis. *J Psychosoc Oncol*. May-Jun;36(3):350-363. <https://www.ncbi.nlm.nih.gov/pubmed/29424665>

- Kohler JN, Turbitt E, Lewis KL, Wilfond BS, Jamal L, Peay HL, Biesecker LG, Biesecker BB. (2017) Defining personal utility in genomics: A Delphi study. *Clin Genet*. Sep;92(3):290-297. <https://www.ncbi.nlm.nih.gov/pubmed/28218387>
- Kohler JN, Turbitt E, Biesecker B (2017) Personal utility in genomic testing: a systematic literature review. *Eur J Hum Genet*. Epub ahead of print. <http://www.nature.com/ejhg/journal/vaop/ncurrent/full/ejhg201710a.html>
- Solomon I, Harrington E, Hooker G, Erby L, Axilbund J, Hampel H, Semotiuk K, Blanco A, Klein WM, Giardiello F, Leonard L (2017) Lynch Syndrome Limbo: Patient understanding of variants of uncertain significance. *J Genet Couns* (Epub ahead of print) <https://www.ncbi.nlm.nih.gov/pubmed/28127677>
- Baxter M, Erby L, Roter D, Bernhardt BA, Terry P, Guttmacher A. (2016) Health screening behaviors among adults with hereditary hemorrhagic telangiectasia in North America. *Genet Med*. (Epub ahead of print) <http://www.nature.com/gim/journal/vaop/ncurrent/abs/gim2016161a.html>
- Lamb AE, Biesecker BB, Umstead KL, Muratori M, Biesecker LG, Erby LH. Family functioning mediates adaptation in caregivers of individuals with Rett syndrome. *Patient Educ Couns*. 2016. Epub ahead of print. <http://www.sciencedirect.com/science/article/pii/S073839911630283X>
- Rodriguez SA, Roter DL, Castillo-Salgado C, Hooker GW, Erby LH. Translation and validation of a Spanish-language genetic health literacy screening tool. *Health Psychol*. 2015 Feb; 34(2): 120-9. <http://psycnet.apa.org/journals/hea/34/2/120/>
- Schaa K, Roter D, Biesecker B, Cooper L, Erby L. Genetic counselors' implicit racial attitudes and their relationship to communication. *Health Psychol*. 2015 Feb;34(2):111-9. <http://psycnet.apa.org/journals/hea/34/2/111/>
- Turriff A, Levy HP, Biesecker B. Factors associated with adaptation to Klinefelter syndrome: The experience of adolescents and adults. *Patient Educ Couns*. 2015 Jan;98(1):90-5. <http://www.ncbi.nlm.nih.gov/pubmed/25239793>
- Cohen JS, Levy HP, Sloan J, Dariotis J, Biesecker BB. Depression among adults with Neurofibromatosis Type 1: Prevalence and impact on quality of life. *Clin Genet*. 2014 Dec 23. <http://www.ncbi.nlm.nih.gov/pubmed/25534182>
- Jamal L, Sapp JC, Lewis K, Yanes T, Facio FM, Biesecker LG, Biesecker BB. Research participants' attitudes towards the confidentiality of genomic sequence information. *Eur J Hum Genet*. 2014 Aug;22(8):964-8. <http://www.nature.com/ejhg/journal/v22/n8/full/ejhg2013276a.html>



- Hooker GW, Peay H, Erby L, Bayless T, Biesecker BB, Roter DL. Genetic literacy and patient perceptions of IBD testing utility and disease control: a randomized vignette study of genetic testing. *Inflamm Bowel Dis*. 2014 May;20(5):901-8.  
[http://journals.lww.com/ibdjournal/Abstract/2014/05000/Genetic\\_Literacy\\_and\\_Patient\\_Perceptions\\_of\\_IBD.14.aspx](http://journals.lww.com/ibdjournal/Abstract/2014/05000/Genetic_Literacy_and_Patient_Perceptions_of_IBD.14.aspx)
- Guan Y, Roter DL, Huang A, Erby L, Chien Y, Hwu W. Parental discussion of G6PD deficiency and child health: implications for clinical practice. *Arch Dis Child*. 2014 Mar; 99(3): 251-5.  
<http://www.ncbi.nlm.nih.gov/pubmed/24291731>
- Singleton A, Erby LH, Foisie K, Kaphingst K. Informed choice in direct-to-consumer genetic testing (DTCGT) websites: a content analysis of risks, benefits and limitations. *J Genet Counsel* 2012 June; 21(3). 433-9. <http://www.springerlink.com/content/5617176524076m54/?MUD=MP>
- Truitt M, Biesecker B, Capone G, Bailey T, Erby L. The role of hope in adaptation to uncertainty: the experience of caregivers of children with Down syndrome. *Patient Educ Couns*. 2012 May;87(2):233-8. <http://www.sciencedirect.com/science/article/pii/S0738399111004666>
- Butrick M, Kaphingst K, Erby LH, Haywood C, Beach MC, Levy HP. Patient reactions to personalized medicine vignettes: an experimental design. *Genet Med* 2011 May;13(5): 421-8.  
<http://www.nature.com/gim/journal/v13/n5/full/gim9201172a.html>
- Turriff A, Levy H, Biesecker B. Prevalence and psychosocial correlates of depressive symptoms among adolescents and adults with Klinefelter syndrome. *Genet Med* 2011 13(11):966-972.  
<http://www.nature.com/gim/journal/v13/n11/full/gim2011161a.html>
- Cohen, JS, Biesecker B. Quality of life in rare genetic conditions: A systematic review of the literature. *Am J Med Genet Part A* 2010 May;152A(5):1136-1156.  
<http://onlinelibrary.wiley.com/doi/10.1002/ajmg.a.33380/full>
- Caleshu C, Shiloh S, Price C, Sapp J, Biesecker B. Invasive prenatal testing decisions in pregnancy after infertility. *Prenatal Diag* 2010;30(6):575-581.  
<http://onlinelibrary.wiley.com/doi/10.1002/pd.2529/abstract>
- Sapp JC, Hull SC, Duffer S, Zornetzer S, Sutton E, Marteau T, Biesecker B. Ambivalence toward undergoing invasive prenatal testing: An exploration of its origins. *Prenatal Diag* 2010;30(1):77-82.  
<http://onlinelibrary.wiley.com/doi/10.1002/pd.2343/abstract;jsessionid=A9D3EC4324968BA4B29D5AD96FECA778.d03t01>
- Waggoner B, Leib J, Farmer J, Biesecker B. Exploration of transitional life events in individuals with Friedreich Ataxia: Implications for genetic counseling. *Behav Brain Funct*. 2010 Oct. 27;6(65).  
<http://www.behavioralandbrainfunctions.com/content/6/1/65>
- Geller G, Micco E, Silver RJ, Kolodner K, Bernhardt BA. The role and impact of personal faith and religion among genetic service providers. *Am J Med Genet C Semin Med Genet*. 2009 Feb 15;151C(1):31-40.

[http://www.ncbi.nlm.nih.gov/pubmed/19170100?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/19170100?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Lipinski SE, Lipinski MJ, Biesecker LJ, Biesecker BB. *Am J Med Genet C Semin Med Genet.* 2006 Nov 15;142C(4):232-40

[http://www.ncbi.nlm.nih.gov/pubmed/17068805?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/17068805?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Bernhardt B, Mastromarino C, Roter D, Geller G, How do Obstetric Providers Discuss Referrals for Prenatal Genetic Counseling? *J Genet Couns* 2005 Apr;14(2):109-17.

[http://www.ncbi.nlm.nih.gov/pubmed/15959642?ordinalpos=206&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15959642?ordinalpos=206&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Gamm J, Nussbaum R, Biesecker B: Genetics and Alcoholism Among At-Risk Relatives I: Perceptions of Cause, Risk, and Control *Am J Med Genet* 128A(2):144-150, 2004.

[http://www.ncbi.nlm.nih.gov/pubmed/15214005?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15214005?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) .

Gamm J, Nussbaum R, Biesecker B: Genetics and Alcoholism Among At-Risk Relatives II: Interest and Concerns about Hypothetical Genetic Testing for Alcoholism Risk. *Am J Med Genet* 128A(2);151-155, 2004.

[http://www.ncbi.nlm.nih.gov/pubmed/15214006?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15214006?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Apse K, Biesecker B, Giardiello F, Fuller B, Bernhardt B: Perceptions of Genetic Discrimination Among At-Risk Relatives of Colorectal Cancer Patients *Genet Med* 2004 Nov-Dec;6(6):5106

[http://www.ncbi.nlm.nih.gov/pubmed/15545747?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15545747?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Herrick EK, Nussbaum R, Holtzman NA, Wissow L. Asking fathers: a study of psychosocial adaptation. *Haemophilia.* 2004 Sep;10(5):582-9

[http://www.ncbi.nlm.nih.gov/pubmed/15357787?ordinalpos=5&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15357787?ordinalpos=5&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

James CA, Holtzman NA, Hadley DW. Perceptions of reproductive risk and carrier testing among adolescent sisters of males with chronic granulomatous disease. *Am J Med Genet.* 2003 May 15;119C(1):60-9.

[http://www.ncbi.nlm.nih.gov/pubmed/12704639?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/12704639?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Redlinger-Grosse K, Bernhardt BA, Berg K, Muenke M, Biesecker BB. The decision to continue: the experiences and needs of parents who receive a prenatal diagnosis of holoprosencephaly. *Am J Med Genet.* 2002 Nov 1;112(4):369-78.

[http://www.ncbi.nlm.nih.gov/pubmed/12376939?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/12376939?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Rosenthal ET, Biesecker LG, Biesecker BB. Parental attitudes toward a diagnosis in children with unidentified multiple congenital anomaly syndromes. *Am J Med Genet.* 2001 Oct 1;103(2):106-14.

[http://www.ncbi.nlm.nih.gov/pubmed/11568915?ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_DefaultReportPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/11568915?ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)