MEETING LOCATIONS

DATE/TIME	FUNCTION	LOCATION
Wednesday, July 13		
6:00 p – 8:00 p	Registration	Salon A Foyer
7:00 p -	SERGG Board of Directors Dinner Meeting	Top of the Plaza (12th Floor)
Thursday, July 14		
8:45 a – 9:45 a	Breakfast for Invited Speakers	Swannanoa Room
10:00 a – 12:00 p	Telegenetics Workgroup	Windsor Ballroom
12:00 p – 5:00 p	Registration	Salon A Foyer
12:15 p – 1:15 p	ISS-Sanofi (with box lunch)	Swannanoa Room
1:30 p – 7:00 p	Platform Session 1	Salon A
3:35 p – 4:05 p	Break	Salon A Foyer
7:00 p – 9:00 p	Reception and Poster Session	Salon B-C
Friday, July 15		
7:30 a – 8:30 a	ISS-Ultragenyx Pharm (with breakfast)	Windsor Ballroom
7:30 a – 8:30 a	Continental Breakfast	Salon B-C
7:30 a – 6:00 p	Exhibits/Posters	Salon B-C
7:30 a – 3:00 p	Registration	Salon A Foyer
8:30 a – 10:15 a	Platform Session 2	Salon A
8:45 a – 12:00 p	Consumer Alliance	Alexander Room
10:15 a – 10:45 a	Break	Salon B-C
10:45 a – 12:00 p	Platform Session 3	Salon A
12:00 p – 1:00 p	Lunch	Windsor Ballroom and Foyer
1:00 p – 2:45 p	Platform Session 4	Salon A
2:45 p – 3:00 p	Travel to Concurrent Industry Supported Symposia	
3:00 p – 4:00 p	ISS-PTC Therapeutics	Victoria Room
3:00 p – 4:00 p	ISS-Invitae	Windsor Ballroom
3:00 p – 6:00 p	ISS-Horizon Pharmaceutical	Swannanoa Room
4:30 p – 5:30 p	Spark Therapeutics	Victoria Room
4:30 p – 5:30 p	Rhythm Pharmaceuticals	Windsor Ballroom
Friday, July 15 - CONCURRENT SESSION – SERN CONSUMER ALLIANCE		
8:45 a – 10:15 a	Consumer Alliance Plenary	Alexander
10:15 a – 10:45 a	Break	Alexander
10:45 a – 12:00 p	Consumer Alliance Plenary	Alexander
12:00 p – 1:00 p	Lunch and State Updates	Alexander
Saturday, July 16		
7:30 a – 8:30 a	ISS – BioMarin (with breakfast)	Windsor Ballroom
7:30 a – 8:30 a	Continental Breakfast	Salon B-C
7:30 a – 10:30 a	Exhibits and Posters	Salon B-C
8:00 a – 10:30 a	Registration Desk Open	Salon A Foyer
8:30 a – 10:00 a	Platform Session 5	Salon A
10:00 a – 10:45 a	Break	Salon B-C
10:45 a – 12:15 p	Platform Session 6	Salon A
12:30 p – 1:00 p	SERGG Business Meeting	Salon A

SOUTHEAST REGIONAL GENETICS NETWORK (SERN)
39th ANNUAL MEETING of the SOUTHEASTERN REGIONAL GENETICS GROUP (SERGG)
July 14-16, 2022
Asheville, North Carolina

This meeting is supported in part by a grant from the Maternal and Child Health Bureau (MCHB) (Title V, Social Security Act), Grant #UH7MC30772 Health Resources and Services Administration (HRSA), Department of Health and Human Services.

Wednesday, July 13, 2022

6:00 pm – 8:00 pm **Registration – SALON A FOYER**

7:00 pm - **SERGG Board of Directors Dinner Meeting – TOP OF THE PLAZA (12th Floor)**

All Sessions and Workgroup Meetings are open to all Registrants!

Thursday, July 14, 2022

8:45 am – 9:45 am **Breakfast for SERN and SERGG Invited Speakers and Networking** (by invitation) – **SWANNANOA ROOM**
Hosted by Rani Singh, PhD, RD, LD, Hans Andersson, MD and Neena Champaigne, MD

10:00 am – 12:00 pm **Telegenetics Workgroup -** Hans Andersson, MD, Chair – **WINDSOR BALLROOM**
This annual telegenetics meeting offers several presentations of diverse interest. Attendees do not need any experience in telegenetics. Plenty of time will be available for questions and discussion.
(CME Approved – must attend entire session)

10:00 am – 10:05 am **Opening Remarks and Updates of Telegenetics Activities**
Hans Andersson, MD, Tulane University, SERN Co-PI

10:05 am – 10:10 am **Regional Vision of Telegenetics**
Rani Singh, PhD, RD, LD, Emory University School of Medicine, SERN Co-PI

10:10 am – 10:50 am **Increasing Access to Genetic Care Through eConsults and eVisits**
Mike Lyons, MD, Greenwood Genetic Center

10:50 am – 11:35 am **Tele-Education Panel**
Emily Boothe, MS, CGC, University of Mississippi Medical Center
Lindsay Ryan, MS, RD, LD, Emory University
Aileen Kenneson-Adams, PhD, MS, Emory University
Moderator: Hans Andersson, MD, Tulane University, SERN Co-PI

11:35 am – 12:00 pm **Telemedicine Workgroup Discussion**
Rani Singh, PhD, RD, LD, Emory University School of Medicine

12:15 pm – 1:15 pm **Industry Supported Symposium – Sanofi – SWANNANOA ROOM**
Respiratory Involvement in Lysosomal Storage Disorders
(Box Lunch provided for attendees) *(CME Not Provided)*

12:00 pm – 1:30 pm **Lunch On Your Own**

12:00 pm – 5:00 pm **Registration – SALON A FOYER**

1:30 pm – 6:00 pm **Platform Session 1 –** *(CME Sessions marked with *)* – **SALON A**
Chair: Rani Singh, PhD, RD, LD, Emory University School of Medicine

1:30 pm – 1:40 pm **Introduction** – Rani Singh, PhD, RD, LD, Emory University School of Medicine

1:40 pm – 1:55 pm **Health Resources and Services Administration** (**HRSA) Update**
Alisha Keehn, MPA, HRSA, Genetic Services Branch
(CME Not Provided)

1:55 pm – 2:15 pm	**National Coordinating Center (NCC) and Genetic Services Branch, MCHB Update** Megan Lyon, MPH, American College of Medical Genetics and Genomics *(CME Not Provided)*
2:15 pm –2:35 pm	**Update from the Advisory Committee on Heritable Disorders in Newborns and Children** Cynthia Powell, MD, University of North Carolina at Chapel Hill *(CME Not Provided)*
2:35 pm – 2:55 pm	**Addressing Genetic Conditions through a Trustworthy Community Engagement Lens*** Lori Carter Edwards, PhD, Kaiser Permanente Bernard J. Tyson School of Medicine
2:55 pm – 3:15 pm	**Transitioning Strategies for Providers*** Jordan Kemere, MD, Baylor College of Medicine Transitioning
3:15 pm – 3:35 pm	**Clinical Genomics: Pitfalls, Perils, and Opportunities*** Jaime Vengoechea, MD, Emory University
3:35 pm – 4:05 pm	**Break – SALON A FOYER**
4:05 pm – 4:25 pm	**RDAC's: How Policy Impacts Rare Disease*** Tara Britt, Rare Disease Innovations Institute
4:25 pm – 4:45 pm	**Role of Families in Adding Disorders to NBS: GAMT Deficiency*** Heidi Wallis, Association of Creatine Deficiencies
4:45 pm – 5:05 pm	**Georgia's Experience with Newborn Screening for Lysosomal and Peroxisomal Disorders*** Gwen Gunn, PhD, Emory University
5:05 pm – 5:35 pm	**Keynote Address: New Insights into Hepatic Glycogen Storage Disease*** Priya Kishnani, MBBS, Duke University
5:35 pm – 5:55 pm	**PKU and Gene Therapy*** Cary Harding, MD, Oregon Health and Science University
5:55 pm – 6:00 pm	Closing Remarks

6:00 pm – 7:00 pm	**Poster presentations – SALON A** **(2 min video per poster)** *(CME Not Provided)*
7:00 pm – 9:00 pm	**Welcome Reception and Poster Session (Cash Bar) – SALON B-C** **Supported by all of the exhibitors.** *(CME Not Provided)*

Be sure to visit each exhibit at some time during the meeting and get your card punched for the gift card drawing!

Please place all phones on vibrate when in the meeting rooms. There is no conference code for wi-fi in the meeting rooms. Free wi-fi is available in the lobby areas and guest rooms.

There are currently no COVID mandates in the State of North Carolina. However, the hotel is recommending masks be worn in any public areas, regardless of vaccination status.

All Sessions and Workgroup Meetings are open to all Registrants!

Friday, July 15, 2022

7:30 am – 8:30 am **Industry Supported Symposium – Ultragenyx Pharmaceutical – WINDSOR BALLROOM**
LCHAD: Cardiovascular and Retinal Complications – Melanie Gillingham, PhD
(Continental Breakfast included for attendees) *(CME Not Provided)*

7:30 am – 8:30 am **Continental Breakfast – (for those not attending Symposium) – SALON B-C**

7:30 am – 3:00 pm **Registration – SALON A FOYER**

7:30 am – 2:45 pm **Vendor Exhibits and Posters – SALON B-C**

8:30 am – 8:45 am **Welcome/Announcements** – Neena Champaigne, MD, President, SERGG – **SALON A**

8:45 am – 10:15 am **Platform Session 2** *(CME Approved)* – **SALON A**
Moderator: Dan Sharer, PhD – University of Alabama at Birmingham

- 8:45 am – 9:30 am **Invited Speaker: Michael Gambello, MD, PhD – Emory University School of Medicine**
  An Update on the All of Us Research Program and the South East Enrollment Center
- 9:30 am – 9:45 am ***Experiences with Pediatric Genome Sequencing Incidental Findings***
  Anna Hurst, MD, University of Alabama at Birmingham
- 9:45 am – 10:00 am ***Primary Care Providers' Use of Genetic Services in the Southeast United States: Barriers, Facilitators, and Strategies***
  Erin Seibel, BA, Emory University School of Medicine
- 10:00 am – 10:15 am ***Factors Contributing to the Underdiagnosis of Hereditary Transthyretin Amyloidosis (hATTR) In African American Patients***
  Kelsi Hagerty, BS, Emory University School of Medicine

10:15 am – 10:45 am **Break with Exhibits and Posters – SALON B-C**

10:45 am – 11:45 am **Platform Session 3** *(CME Approved)* – **SALON A**
Moderator: Laura Pollard, PhD, Greenwood Genetic Center

- 10:45 am – 11:00 am ***Long-term Follow-up of Cipaglucosidase Alfa/Miglustat in Ambulatory Patients with Pompe Disease: An Open-label Phase I/II Study (ATB200-02)***
  Priya Kishnani, MD, Duke University
- 11:00 am – 11:15 am ***The Impact of Fabry Disease on Growth in Males***
  Harleigh Quick, MMSc, Emory University School of Medicine
- 11:15 am – 11:30 am ***Liver Directed AAV Gene Therapy Reverses Progression of Glycogen Storage Disease Type IX γ2 in Mice***
  Rebecca Gibson, BA, Duke University
- 11:30 am – 11:45 am ***Clinical Trial of a Breath Test for Ammonia as a Potential At-home Monitoring Method for Urea Cycle Disorders***
  Robert Latour, PhD, Clemson University

11:45 am – 12:00 pm **Travel to Windsor Ballroom for Lunch**

12:00 pm – 1:00 pm **Lunch – WINDSOR BALLROOM AND FOYER**

1:00 pm – 2:45 pm **Platform Session 4** *(CME Approved)* – **SALON A**
Moderator: Barbara DuPont, PhD – Greenwood Genetic Center

- 1:00 pm – 1:45 pm **Invited Speaker: Colleen Jackson-Cook, PhD – Virginia Commonwealth University**
  Unmasking Cellular Changes Associated with Trisomy 21: Studies of People with Mosaic Down Syndrome or Down Syndrome Regression Disorder

1:45 pm – 2:00 pm ***An Understanding of Liver Directed Gene Therapy and Associated Immunogenicity in Large Animal Models: A Review of the Literature***
Rebecca Gibson, BA, Duke University

2:00 pm – 2:15 pm ***LysoGb3 Quantification in Dried Blood Spots of Fabry Disease Patients***
Francyne Kubaski, PhD, Greenwood Genetic Center

2:15 pm – 2:30 pm ***Access to Low Protein-modified Food Associated with Clinical Biomarkers in Patients with Phenylketonuria***
Saran Gurung, MD, Emory University School of Medicine

2:30 pm – 2:45 pm ***Efficacy of AVV Genome Editing Vectors in GSD 1a Infantile Mice***
Benjamin Arnson, BS, Duke University

SERN Concurrent Consumer Alliance Session – ALEXANDER ROOM
(Dietitians are invited to attend these sessions)

Moderators: Amy Cunningham, MS, RD, LDN, Tulane University
Jessica Williamson, MS, RD, LD, Emory University School of Medicine
(CME Not Provided)

8:45 am – 9:00 am	**Welcome and Introductions**,
9:00 am – 9:15 am	**Update on HRSA Grant**, Rani Singh, PhD, RD, LD
9:15 am – 9:45 am	**Transitioning and Planning for Children with Healthcare Needs** Jordan Kemere, MD, Baylor College of Medicine
9:45 am – 10:15 am	**Role of Families in Adding Disorders to NBS: GAMT Deficiency** Heidi Wallis, Association of Creatine Deficiencies
10:15 am – 10:45 am	**Break**
10:45 am -11:15 am	**RDACs: How Policy Impacts Rare Disease** Tara Britt, Rare Disease Innovations Institute
11:15 am – 12:00 pm	**Panel** –Beyond my Child: How We Expanded the Reach to the Community
12:00 pm – 1:00 pm	**Lunch and Closing Remarks**

2:45 pm – 3:00 pm **Travel to Concurrent Industry-Supported Symposium**

CONCURRENT INDUSTRY-SUPPORTED SYMPOSIUM
(CME Not Provided)

TIME	VICTORIA ROOM	WINDSOR BALLROOM	TIME	SWANNANOA ROOM
3:00 pm – 4:00 pm	"Genetic Causes of Cerebral Palsy-Clinical and Diagnostic Considerations" – J Jay Gargus, MD, UC Irvine Health and Children's Hospital – **PTC Therapeutics**	"Implementation of Artificial Intelligence in Clinical Genetic Testing" - **Invitae**	3:00 pm – 4:30 pm	"Neuropsychological Impacts of Urea Cycle Disorders" – Barbara Burton, MD, Feinberg School of Medicine and Rani H Singh, PhD, RD, LD, Emory University School of Medicine - **Horizon Therapeutics**
4:00 pm – 4:30 pm	BREAK	BREAK		
4:30 pm – 5:30 pm	"Genetic Disease and Gene Therapy" – Dawn Laney, MS, CGC, Emory University School of Medicine – **Spark Therapeutics**	"Rare Genetic Diseases of Obesity" – Jessica Duis, MD, Children's Hospital Colorado – **Rhythm Pharmaceuticals**		

5:30 pm **Adjournment for the Day** – Enjoy your evening in Asheville!

All Sessions and Workgroup Meetings are open to all Registrants!

Saturday, July 16, 2022

7:30 am – 8:30 am **Industry Supported Symposium – BioMarin Pharmaceuticals – WINDSOR BALLROOM**
Even Further Beyond the Bone: Broadening the Understanding of Skeletal Dysplasia
(Continental Breakfast included for attendees) *(CME Not Provided)*

7:30 am – 8:30 am **Continental Breakfast – (for those not attending Symposium) – SALON B-C**

7:30 am – 10:30 am **Vendor Exhibits and Posters – SALON B-C**

8:00 am – 10:30 am **Registration – SALON A FOYER**

8:30 am – 8:45 am **Announcements** – Neena Champaigne, MD, President, SERGG – **SALON A**

8:45 am – 10:00 am **Platform Session 5** *(CME Approved)* – **SALON A**
Moderator: Neena Champaigne, MD, Medical University of South Carolina

- 8:45 am – 9:30 am **Invited Speaker: Kathryn Swoboda, MD – Mass General Hospital**
  The Journey Towards Effective Newborn Screening and Treatment of SMA
- 9:30 am – 9:45 am ***Carnitine-acylcarnitine Translocase Deficiency with Novel SLC25A20 Variation in a Newborn of Hispanic Descent***
  Paulo Borjas Mendoza, MD, University of Miami
- 9:45 am – 10:00 am ***Improving Blood Spot Quality in Newborn Screening: Outcomes of an Action Research Project***
  Jane DeLuca, PhD, Clemson University

10:00 am – 10:45 am **Break with Exhibits and Posters – SALON B-C**

10:45 am – 12:15 pm **Platform Session 6** *(CME Approved)* – **SALON A**
Moderator: Rani Singh, PhD, RD, LD, Emory University

- 10:45 am – 11:30 am **Invited Speaker: Hans Andersson, MD – Tulane University**
  The State of the Genetics Workforce in America, 2022
- 11:30 am – 11:45 pm ***Transforming Collaborations Through Family Engagement, Partnership, and Leadership***
  Molly Martzke, BBA, Expecting Health
- 11:45 am – 12:00 pm ***Genetic Counselors' Perceptions of Student Supervision Across Service Delivery Models***
  Lauren Lichten, MS, Emory University School of Medicine
- 12:00 pm – 12:15 pm ***Knowledge Gains of Providers Specializing in Inherited Metabolic Disorders After Participating in eGNA's Genetic Nutrition Echo Cohort Traineeship***
  Teresa Douglas, PhD, Emory University School of Medicine

12:30 pm – 1:00 pm **SERGG Business Meeting & Student Award Presentations –** Barbara DuPont, PhD, Incoming President – **SALON A**

1:00 pm **Adjournment** – See you next year!

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Medical Association of Georgia through the joint providership of Self Regional Healthcare and the Southeastern Regional Genetics Group (SERGG). Self Regional Healthcare is accredited by the Medical Association of Georgia to provide continuing medical education for physicians.

Self Regional Healthcare designates this live activity for a maximum of 11.25 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

SAVE THE DATES

SERN/SERGG ANNUAL MEETING

July 13-15, 2023

Charleston Marriott Hotel
170 Lockwood Drive
Charleston, South Carolina

PLATFORM PRESENTATIONS IN ORDER PRESENTED

EXPERIENCES WITH PEDIATRIC GENOME SEQUENCING INCIDENTAL FINDINGS

Hurst A
Department of Genetics, University of Alabama at Birmingham, Birmingham, AL

Incidental findings (IF) represent a category of unexpected results not intentionally sought during filtration and analysis, as opposed to secondary findings (SF). Professional bodies developed a list of actionable SF (Miller et al, 2021), but there is not policy pertaining to IF.
The Children's of Alabama Genome Sequencing (COAGS) study has performed genome sequencing in 145 pediatric patients with rare diseases. Participants can elect to receive the following IF: childhood onset untreatable, adult onset untreatable, adult onset treatable, carrier status, pharmacogenetic. These are not restricted to a list of genes but must be likely pathogenic/pathogenic. 99% (143/145) of participants elect to receive at least one category and 95% (138/145) opt to receive all findings. We have returned 57 adult/childhood onset IF/SF in 45 participants (31% of all study participants). These include genes on the ACMG SFv3.0 list (*TTN, APOB, LDLR, KCNQ1*), but also genes responsible for similar conditions such as adult-onset cancer predisposition (*CHEK2, HOXB13, MITF*) or arrhythmias/cardiac disease (*SCN3B, MYBPC3, CITED2*). The most common variants are risk factor predispositions in *NOD2* (8x), Factor V Leiden (6x), and Prothrombin-*F2* (2x). Particularly challenging are low-penetrance variants (*HMBS*) or variants associated with both recessive and dominant conditions (*ABCA4, SLC7A9, SLC6A5*). Participants receive on average 3.2 (0-9) carrier status and 5.4 (2-11) pharmacogenetic results. We will discuss challenges including counseling, familial cascade testing, and medical management and also highlight benefits and lessons learned in collaboration with other genome sequencing studies. Future community guidance may be warranted as expanded sequencing increases IF detection.

PRIMARY CARE PROVIDERS' USE OF GENETIC SERVICES IN THE SOUTHEAST UNITED STATES: BARRIERS, FACILITATORS, AND STRATEGIES

Seibel E[1], Gunn G[1], Ali N[1], Jordan E[2], and Kenneson A[1]
[1]Department of Human Genetics, Emory University, Atlanta, GA; [2]Rollins School of Public Health, Emory University, Atlanta, GA

Introduction: Collectively, genetic diseases are not that rare, and primary care providers (PCPs) are being asked to help provide genetic services. Previous studies identified barriers that impact PCPs including limited knowledge, training, and time/resources. This study examined specific barriers within the Southeast Regional Genetics Network (SERN) and resources that would help eliminate those barriers. Methods: PCPs were recruited through provider networks, and invited to participate in semi-structured interviews, conducted via Zoom. Interview transcripts were independently coded by two coders using MAXQDA software. Thematic analysis was conducted.
Results: PCPs face barriers at three levels: provider, system, and patient. System barriers included lack of genetics providers and challenges with institutional processes, leading PCPs to coordinate referrals with other specialists or independently manage patients. Lack of genetics knowledge was a provider-specific barrier and many PCPs contacted either genetics providers or other colleagues for assistance. Patient barriers included lack of genetics information and social needs. Many PCPs educated patients regarding genetics appointments or testing. Assistance from genetics providers, streamlined referral processes, prior genetics experience, and motivated patients facilitated genetic services. PCPs suggestions for future resources included clear referral guidelines and education, access to genetics providers, and simplified ordering processes. Conclusions: Southeastern PCPs face barriers with genetic services at three levels (systems, providers, and patients), and PCPs use creative strategies to address these barriers. By targeting barriers that uniquely impact providers, systems, and patients, and building upon strategies PCPs are already using, genetics providers can support PCPs in the provision of genetic services.

PLATFORM PRESENTATIONS IN ORDER PRESENTED

FACTORS CONTRIBUTING TO THE UNDERDIAGNOSIS OF HEREDITARY TRANSTHYRETIN AMYLOIDOSIS (HATTR) IN AFRICAN AMERICAN PATIENTS

Hagerty KJ, Rosen AR, Ali N, McDaniels B, Brown E, Demo E, Guan Y, Ogunniyi M, Morris A, and Bhatt K
Emory University Genetic Counseling Training Program, Atlanta, GA

Hereditary transthyretin amyloidosis (hATTR) is a progressive, multisystemic, and life-threatening disease disproportionately affecting individuals of African descent. Estimated prevalence of hATTR in all Black individuals in the US is 3.4%. hATTR is often mis- or underdiagnosed, partially because many of its symptoms overlap with other cardiac conditions. Additional underlying reasons have not been described. This study brings to light additional factors that may contribute to the underdiagnosis of hATTR in the African American population. Participants were ascertained from the Emory University Amyloidosis Clinic. 11 interviews were conducted via telephone, transcribed, and coded with two different coders for thematic analysis. A Cohen's kappa of 0.74 was reached. Participants cited misdiagnosis, mistrust of healthcare providers, denial or misunderstanding about one's own health risks, and poor family communication as some of the most prevalent contributing factors to the underdiagnosis of hATTR. Appropriate referrals to heart failure providers and family letters were cited as contributing factors to proper diagnosis of hATTR. Importantly, participants highlighted the need for more personal and intimate relationships with providers to improve uptake of genetic testing in this population. Participants suggested engaging directly with the Black community to improve trust. This study highlights the need for improvements to be made regarding diagnosis of hATTR in the African American population. Participants suspected to have hATTR should be referred to a heart failure cardiologist for appropriate diagnosis. Genetic testing and follow-up genetic counseling is recommended to appropriately inform the patient of health risks for themselves and their family members.

LONG-TERM FOLLOW-UP OF CIPAGLUCOSIDASE ALFA/MIGLUSTAT IN AMBULATORY PATIENTS WITH POMPE DISEASE: AN OPEN-LABEL PHASE I/II STUDY (ATB200-02)

Kishnani P[1], Schoser B[2], Bratkovic D[3], Clemens PR[4], Goker-Alpan O[5], Ming X[6], Mark Roberts M[7], Vorgerd M[8], Sivakumar K[9], van der Ploeg AT[10], Goldman M[11], Jacquelyn Wright J[11], Holdbrook F[11], Jain V[11], Sitaraman S[11], Wasfi Y[11], Mozaffar T[12], and Byrne BJ[13]
[1]Duke University Medical Center, Durham, NC; [2]Friedrich-Baur-Institut, Neurologische Klinik, Ludwig-Maximilians-Universität München, Munich, Germany; [3]PARC Research Clinic, Royal Adelaide Hospital, Adelaide, SA, Australia; [4]Department of Neurology, University of Pittsburgh School of Medicine, Division Chief, Neurology, Medical Service Line, VA Pittsburgh Healthcare System, Pittsburgh, PA; [5]Lysosomal and Rare Disorders Research and Treatment Center, Fairfax, VA; [6]Neurology, Rutgers New Jersey Medical School, Newark, NJ; [7]Salford Royal NHS Foundation Trust, Salford, UK; [8]Department of Neurology, University Hospital Bergmannsheil, Heimer Institute for Muscle Research, Bochum, Germany; [9]Neuromuscular Clinic and Research Center, Phoenix, AZ; [10]Erasmus MC University Medical Center, Rotterdam, Netherlands; [11]Amicus Therapeutics, Inc., Philadelphia, PA; [12]University of California, Irvine, CA; [13]University of Florida, Gainesville, FL

Cipaglucosidase alfa/miglustat is an investigational, two-component therapy (cipaglucosidase alfa: novel recombinant human GAA; miglustat: enzyme stabilizer) for Pompe disease. We report data ≤36 months for 6-minute walk distance (6MWD) and % predicted sitting forced vital capacity (FVC) from ATB200-02 (NCT02675465). Our ongoing study enrolled 3 cohorts of ambulatory patients: 2–6 years (n=11; age 18–65 years) or ≥7 years (n=6; age 18–75 years) prior enzyme replacement therapy (ERT) with alglucosidase alfa, and ERT naïve (n=6; age 18–65 years). Doses were 20 mg/kg cipaglucosidase alfa by intravenous infusion/260 mg miglustat orally biweekly. Change from baseline (CFBL) in multiple endpoints were assessed. We report data at 6, 12, 24 and 36 months. Baseline characteristics were representative of the Pompe population. At 6, 12, 24 and 36 months, durable improvements in 6MWD (meters) were seen: integrated analyses of ERT-experienced cohorts, mean(±standard deviation [SD]) CFBL: 23.1(±44.75), n=16; 33.5(±49.62), n=16; 21.3(±60.90), n=10; 47.8(±53.80), n=8; respectively; ERT naïve: 36.7(±29.08), n=6; 57.0(±29.96), n=6; 60.7(±36.52), n=5; 43.5(±45.19), n=5; respectively. FVC (%) was mostly stable in ERT-experienced cohorts, mean(±SD) CFBL: –0.8(±8.69), n=16; –1.3(±5.95), n=16; –0.9(±7.65), n=10; –0.4(±7.56), n=8; respectively, but improved in ERT-naïve patients: 5.5(±5.68), n=6; 4.5(±7.92), n=6; 6.8(±6.76), n=5; 6.2(±3.42), n=5; respectively. Over 36 months, cipaglucosidase alfa/miglustat was associated with reduced creatine kinase and urine Hex4. The safety profile was similar to approved ERT. Most ERT-experienced patients improved or stabilized in efficacy/biomarker outcomes. ERT-naïve patients showed clinical benefit with cipaglucosidase alfa/miglustat. Improvements in clinical response ≤36 months were sustained and durable.

PLATFORM PRESENTATION IN ORDER PRESENTED

THE IMPACT OF FABRY DISEASE ON GROWTH IN MALES

Quick H[1], Miller K[2], Rosen A[1], Wilcox W[1], and Laney D[1]
[1]Emory University School of Medicine, Department of Medical Genetics, Atlanta, GA; [2] University of Washington Medical Center, Seattle, WA

Fabry disease (FD) is an X-linked progressive, multisystemic inborn error of glycosphingolipid catabolism resulting from pathogenic variants in the α-galactosidase A (*GLA*) gene. Slow growth (mean height/weight <50th percentile) is a documented feature of the condition in pediatric males affected with classic FD. A prior study found a subset of males with FD who experienced a sudden, but delayed, increase in height during puberty that moved them from <50th percentile to > 50th percentile on their growth curve. We hypothesize that this sudden increase in growth in some males may be due to benefits of primary Fabry treatment earlier in life that mitigated the disease's impact on height. In this study, we analyzed height values from 35 classic males affected with FD from the United States to determine if there is a correlation with starting enzyme replacement therapy under a certain age (7, 10, or 18 years old) or the presence of gastrointestinal (GI) symptoms during childhood. 68.8% of participants did not reach predicted final adult height. This research did not find a correlation between timing of treatment initiation or presence of GI symptoms; however, it does confirm that the majority of males (68.8%) with classic Fabry disease in this study did not reach predicted adult height calculated from parental heights.

LIVER DIRECTED AAV GENE THERAPY REVERSES PROGRESSION OF GLYCOGEN STORAGE DISEASE TYPE IX γ2 IN MICE

Gibson RA[1,2], Lim JA[2], Choi SJ[2], Koch RL[2], Bali D[2], Young S[2], Jeck W[3], Sun B[2], Asokan A[4], and Kishnani PS[1,2]
[1]Department of Molecular Genetics and Microbiology, Duke University, Durham, NC; [2]Division of Medical Genetics, Department of Pediatrics, Duke University, Durham, NC; [3]Department of Pathology, Duke University, Durham, NC; [4]Department of Surgery, Duke University, Durham, NC

Liver Glycogen Storage Disease type IX (GSD IX) is the most common hepatic GSD, with an overall estimated prevalence of 1 in 100,000. Liver GSD IX is caused by a deficiency in phosphorylase kinase (PhK). Liver PhK is a complex heterotetramer, comprised of four subunits - α2, β, γ2, δ. Mutations in γ2 are associated with ~25% of liver GSD IX cases (GSD IX γ2). While all patients with GSD IX present with similar symptoms, over 95% of patients with GSD IX γ2 progress to liver fibrosis, cirrhosis, with risk for liver failure and death. Despite life-threatening severity, there are no definitive treatments for GSD IX γ2. Here we report the first liver-directed AAV gene therapy that corrects disease in GSD IX γ2 mice. Phkg2-/- mice underwent short- and long-term treatments at ages 3 and 6 months. All Phkg2-/- mice were injected at 5e12 vg/kg with the mPhkg2 transgene under control of a liver specific promoter in an AAV9 capsid. Mice at age 3 months treated for 2 weeks demonstrated restored PhK enzyme activity, reduced glycogen, decreased ALT and urine Hex4 comparable to wild type levels. Mice at age 3 months treated for 3 months demonstrated restored PhK enzyme activity, reduced glycogen, and decreased biomarkers comparable to wild type levels. Despite pre-existing liver fibrosis, mice at age 6 months treated for 3 months demonstrated similar results. Results of our study suggest that AAV gene therapy may serve as the first definitive treatment for Liver GSD IX γ2.

PLATFORM PRESENTATIONS IN ORDER PRESENTED

CLINICAL TRIAL OF A BREATH-TEST FOR AMMONIA AS A POTENTIAL AT-HOME MONITORING METHOD FOR UREA-CYCLE DISORDERS

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Individuals with a urea cycle disorder (UCD) have a deficiency in one of the liver enzymes that make up the urea cycle, which is responsible for the conversion of ammonia from protein metabolism into urea. Without a properly functioning urea cycle, blood ammonia concentration can become elevated to life-threatening levels. Treatment involves taking an ammonia-scavenging medication combined with medical foods and a low-protein diet. Currently there is no at-home method for monitoring blood ammonia level, thus patients have to go to a specialized center or emergency room to have their blood ammonia level checked if they suspect that it has risen to an unsafe level. To address this, a simple colorimetric breath test for ammonia has been developed as a potential at-home method for monitoring blood ammonia for individuals with a UCD. We are presently conducting a clinical trial with this test method involving two volunteers who have a UCD. Volunteers are requested to do the breath test once per week and whenever they might have their blood ammonia level checked. Results are sent to Dr. Latour for analysis. The results are very encouraging. The test is able to detect a statistically significant reduction in breath ammonia before and after taking ammonia-scavenging medication. In addition, results obtained thus far demonstrate a strong correlation between breath and blood ammonia levels. We believe these are important steps in the development of at-home ammonia testing and this represents the first clinical trial of its kind for the UCD community.

AN UNDERSTANDING OF LIVER DIRECTED GENE THERAPY AND ASSOCIATED IMMUNOGENICITY IN LARGE ANIMAL MODELS: A REVIEW OF THE LITERATURE

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Gene Therapy using adeno-associated virus (AAV) holds great promise for the treatment of human monogenic disorders. However, understanding the associated immune response of gene therapy in large animal models is a needed step to clinical translation. Here we conducted a comprehensive literature review of systemically-administered AAV gene therapy in canine models, with emphasis on liver-directed therapy. Our initial expectations were to observe a lack of B cell response to the transgene, as shown previously in murine studies. Our literature search through Creighton University Health Sciences Library yielded 46 publications which included a total of 147 experiments. The following National Library of Medicine Medical Subject Headings (MeSH) terms were used: “dependovirus”, “adeno associated virus”, “dogs”, “genetic therapy”, “aav”. Experiments were evaluated for promoter, capsid type, dose, number of canines, pretreatments, age of injection, length of study, efficacy, and immune response. Positive immune response was specified into B cell response against capsid and transgene and T cell response against transgene. Most unexpectedly, B and T cell responses to canine transgenes were observed. Results demonstrated that of the 67 liver-directed therapies that measured immune response, 16 reported B cell response to transgene, excluding experiments with repeat administration (12 therapeutics used canine transgenes, 2 used human, 2 used GFP). Immune response also seemed to increase with age. Overall, future canine therapeutic trials should include more uniform parameters for measuring immune response and efficacy. With more standardized quantifications of immunogenicity and efficacy, results from AAV gene therapy canine trials can meaningfully aid in clinical translation.

PLATFORM PRESENTATIONS IN ORDER PRESENTED

LYSOGB3 QUANTIFICATION IN DRIED BLOOD SPOTS OF FABRY DISEASE PATIENTS

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Fabry Disease is caused by the deficiency of the lysosomal enzyme α-galactosidase (α-Gal) leading to the accumulation of globotriaosylceramide (Gb3) and globotriaosylsphingosine (LysoGB3). Several studies have shown that Fabry patients can display storage of LysoGB3 in lysosomes. Diagnosis of Fabry disease can be challenging due to the overlap of clinical symptoms with other common disorders, normal enzyme levels in females (X-linked inheritance), and variants of unknown significance (VUS) in molecular analysis. Thus, biomarkers such as LysoGb3 can be used to aid the diagnosis and treatment monitoring of Fabry disease. LysoGb3 levels were analyzed in dried blood spots (DBS) of Fabry patients (diagnosis confirmed by enzymatic analysis and genotyping). Samples from 119 patients were analyzed (82 males and 37 females) and compared with 118 healthy subjects (62 males and 56 females). Average level of LysoGb3 in male controls was 0.87 nmol/L (range: 0.40-1.61 nmol/L), average level of LysoGb3 in female controls was 0.86 nmol/L (range: 0.37-1.67 nmol/L). The average level of LysoGb3 in Fabry male patients was 51 nmol/L (range: 0.91-248); the average level of LysoGb3 in Fabry female patients was 4.72 nmol/L (range: 0.6-15.35 nmol/L). Twelve Fabry males and 3 females had LysoGb3 levels lower than 3 nmol/L and they all share the same genotype (p.Arg363His). We are currently working on establishing genotype-phenotype correlations and the validation of this biomarker in plasma samples. Currently, it seems like LysoGb3 can aid the discrimination of affected patients from healthy subjects, but depending on the genotype this biomarker might have limitations.

ACCESS TO LOW PROTEIN-MODIFIED FOOD ASSOCIATED WITH CLINICAL BIOMARKERS IN PATIENTS WITH PHENYLKETONURIA

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Background: Low protein-modified foods (LPMF) are thought to provide satiety and variety to patients diagnosed with Phenylketonuria (PKU). We aim to understand whether there is an association between access to LPMF and metabolic control. Additionally, we hope to evaluate whether frequency of one's interaction with the Metabolic Nutrition Therapy 4 Prevention (MNT4P) LPMF bridge program affects control. Methods: Data from MNT4P's LPMF bridge program was used to quantify the number of times each patient accessed LPMF in their first year in the program. A chart review of biomarker data and anthropometrics was then completed for eligible patients. Multivariable fixed-effects linear regression was used to assess average associations between LPMF access, access frequency, and log-transformed blood Phe levels. Results: The median age of our 37-patient study population was 3.8 years (IQR 0.8 – 15.1), and the median number of LPMF orders was four. When adjusting for time-varying covariates, participation in the LPMF program was associated with median blood Phe levels 0.70 times those recorded during baseline (95% CI 0.38 – 1.31; adjusted R^2 0.67, $p < 0.001$). Frequency of LPMF access also was associated with median blood Phe levels (adjusted R^2 0.66, $p <0.001$). Among patients ordering 1-4 times, there was a 29% reduction compared to baseline (95% CI 0.38 – 1.33); those ordering 5-12 times saw a 34% reduction (95% CI 0.33 – 1.32). Conclusion: Access to LPMF was associated with reduced median blood Phe levels in patients with PKU. Improving access to LPMF may have public health salience in the management of PKU.

PLATFORM PRSENTATIONS IN ORDER PRESENTED

EFFICACY OF AVV GENOME EDITING VECTORS IN GSD 1A INFANTILE MICE

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Background: Glycogen storage disease type Ia (GSD 1a) presents as a liver disorder caused by deficiency of glucose-6-phosphatase related to pathogenic variants in *G6PC*. Gene replacement therapy is under development and limited by the rapid loss of non-integrating vectors from the liver early in life. We have developed adeno-associated virus (AAV) vectors for genome editing to stably integrate a *G6PC* transgene. **Methods**: The vectors were administered to 10-day old *G6pc* -/- mice at low (Donor, 2E+12 vg/kg; CRISPR 4E+11 vg/kg), or medium dosages (each vector 4-fold higher). Benefits were evaluated at 6 weeks of age, by comparison of the Donor + CRIPSR group to the Donor only group. **Results**: Mice receiving both Donor + CRISPR vectors had increased blood glucose concentrations during fasting ($p<0.0001$) and decreased liver glycogen compared with mice receiving Donor only ($p<0.001$). Donor vector administration improved blood glucose at baseline following 4 hours fasting ($p<0.0001$) and at 120 minutes following glucose administration ($p<0.01$). Significantly more copies of the *G6PC* transgene were detected in the liver for the CRISPR + Donor group than for the Donor treated mice ($p<0.05$). Additionally, the liver glycogen of the CRISPR + Donor treated mice was significantly lower than untreated *G6pc* -/- controls ($p<0.001$). **Conclusions**: We demonstrated delivery of a CRISPR/Cas9 vector increases efficacy of our *G6PC* transgene. Infant GSD 1a mice receiving both vectors had higher blood glucose, increased transgene copies, and lower liver glycogen. This data suggests combination therapy with CRISPR/Cas9 helps prevent the loss of AAV transgenes in young mice.

CARNITINE-ACYLCARNITINE TRANSLOCASE DEFICIENCY WITH NOVEL *SLC25A20* VARIATION IN A NEWBORN OF HISPANIC DESCENT

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Carnitine-acylcarnitine translocase deficiency (CACTD) is a rare and lethal autosomal recessive disorder of long-chain fatty acid metabolism. It is caused by biallelic pathogenic variants in *SLC25A20*. Less than 100 cases have been reported worldwide to date, predominantly in individuals of Asian descent. A classical and an attenuated forms have been described. The aim of this report is to present the clinical, biochemical, molecular findings, and management of a patient with CACTD in a female of Hispanic descent. A 20-month-old girl, the first liveborn of a nonconsanguineous couple of Cuban descent, was born at 34 weeks gestation. During the first 48 hours of life, the patient presented persistent hypothermia, intermittent tachypnea, hypoglycemia, and emesis, initially attributed to prematurity. Newborn screening, reported on day of life 5, raised concerns for CACTD vs. CPTII deficiency. Further investigations revealed elevated transaminases, CPK, and ammonia. The initial echocardiogram was essentially normal. Dietary intervention and carnitine supplementation were instituted on day of life 7 after biochemical studies were consistent with suspected diagnoses. Molecular analysis confirmed that the patient is homozygous for c.191_192del (p.Phe64*) in *SLC25A20*, a nonsense variant not previously reported in the literature. Parental testing confirmed their carrier status. Despite close follow-up and management, she has had frequent episodes of metabolic crises and developed global developmental delay associated with generalized hypotonia, poor feeding with G-tube dependence, hypertrophic cardiomyopathy, and chronic respiratory failure. CACTD generally has a poor prognosis. Newborn screening and prompt recognition of symptoms leading to timely treatment are essential to improve long-term outcomes.

PLATFORM PRESENTATIONS IN ORDER PRESENTED

IMPROVING BLOOD SPOT QUALITY IN NEWBORN SCREENING: OUTCOMES OF AN ACTION RESEARCH PROJECT

Lowe T[1], Hitt J[2], Taylor A[2], Boyd J[2], Shu L[1], and DeLuca J[1]
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Newborn screening (NBS) is a public health program for detecting and treating infants with inherited metabolic disorders and other conditions. Barriers to obtaining quality blood spot samples and workflow issues can cause delays in reporting NBS results, thus impeding delivery of lifesaving care. Nurse researchers from Clemson University and nursing and medical staff at PRISMA, a regional medical center in South Carolina, met to discuss areas for improving NBS services. An issue of immediate concern to the team was unsatisfactory NBS blood spot filter paper cards rejected by the South Carolina Public Health Laboratory. An action research project was developed to eliminate deficiencies in the quality of the NBS screening blood spot cards. Ten nursery nurses were recruited for the study (20% of total staff). Blood spot cards were inspected using a checklist to identify problems such as clots or layering of blood. The cards were also photographed and verified for quality by independent reviewers. Data collection occurred between August 2021 to February 2022. A total of 140 blood spot cards were examined. For six months prior to study initiation, unsatisfactory cards averaged 5.32% total per month. During the seven-month study period, unsatisfactory cards averaged 1.88% monthly with a goal of <2%. This sustained reduction in unsatisfactory blood spot cards coincided with practice changes due to blood spot inspection by the study nurses. Action research projects can bring academic and clinical agencies together for prioritizing specific problems, setting goals and improving clinical outcomes.

TRANSFORMING COLLABORATIONS THROUGH FAMILY ENGAGEMENT, PARTNERSHIP, AND LEADERSHIP

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Patients and families are essential allies for quality and safety—not only in direct care interactions, but also in quality improvement, safety initiatives, education of health professionals, research, facility design, and policy development. To improve individual's and families' access to genetic information and services, it is critical to engage family leaders at various levels across the genetic healthcare delivery system so their perspectives can help shape the care and resources provided. Actively engaging families as equal partners in their child's health care and decision-making has been associated with reduced unmet health needs, fewer reported problems accessing specialist referrals, lower out-of-pocket expenses and improved physical and behavioral function in children.
An interactive format that engages participants to learn and consider their knowledge and experience for outreach to families and cross-sector collaborations with partners will be used. By showcasing examples of how parent/professional partnerships are working in creating system change, attendees will be encouraged to examine their own activities around partnerships and collaborations. The presenters will host an open discussion to assist in problem-solving barriers to partnerships. This session will provide information on how to establish partnerships across levels and with counterparts in other systems and agencies to create coordinated and inclusive systems of care.

PLATFORM PRESENTATIONS IN ORDER PRESENTED

GENETIC COUNSELORS' PERCEPTIONS OF STUDENT SUPERVISION ACROSS SERVICE DELIVRY MODELS

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Genetic counseling (GC) services are increasingly delivered by phone or video, resulting in more telehealth student clinical rotations. To explore telehealth GC supervision, a 26-item online questionnaire was distributed in 2021 via the American Board of GC and the Association of GC Program Directors. Patient-facing genetic counselors in North America with ≥1-year GC experience, who supervised ≥3 GC students in the last three years could participate. Data from 132 GCs was analyzed. Demographics were consistent with the National Society of Genetic Counselors Professional Status Survey (NSGG PSS) for age, specialty, geographic region, and gender, but respondents had less GC experience ($p=0.02$), were more racially diverse ($p = 0.01$), and were more likely to work in an academic medical setting ($p<0.001$). Most respondents used more than one SDM to provide GC services (93.18%) and supervise students (89.4%). Between 2019 and 2021, 52.3% of respondents supervised ≥5 students in-person; 25% supervised ≥5 students by video, and 47% supervised zero students by telephone. Supervisory competencies related to the student-supervisor working alliance were most difficult by phone and easiest in-person ($p<0.0001$). Less GC experience was associated with higher telephone difficulty scores ($p=0.02$), but no other covariates were associated with difficulty perceptions. In-person service delivery was preferred for both patient care (66.7%) and student supervision (81.1%), but more so for student supervision ($p<0.001$). These findings indicate that service delivery model changes in the field have an impact on GC education and suggest a need for the student-supervisor working alliance to adapt to the telehealth model.

KNOWLEDGE GAINS OF PROVIDERS SPECIALIZING IN INHERITED METABOLIC DISORDERS AFTER PARTICIPATING IN EGNA'S GENETIC NUTRITION ECHO COHORT TRAINEESHIP

Douglas TD, Ryan L, Williamson J, Blair R, Pringle T, and Singh RH
Emory University School of Medicine, Atlanta GA

Background: Few training and information resources exist for inherited metabolic disorder (IMD) practitioners. The Emory University Department of Human Genetics Metabolic Nutrition Program (DOHG-MNP) developed an online professional traineeship to address this need within the IMD profession. **Objective:** Provide a successful online education program for IMD practitioners using University of New Mexico's (UNM) cohort-based ECHO (Extension for Community Healthcare Outcomes) learning model. **Methods**: Since Fall 2020, DOHG-MNP has hosted four 12-week Genetics Nutrition ECHO traineeships [Cohorts I through IV] through our electronic Genetics Nutrition Academy (eGNA). Weekly cohort sessions include didactic with two case reports discussed. Participant expectations, experiences, and gains from traineeship activities were reported via surveys. Data analyzed descriptively. **Results**: Forty-two (89%) of 47 recruited for a cohort completed the traineeship with certificate. 30% were international. Participants were primarily RDs (81%); remaining included MDs, RNs, and NPs. At baseline, 95% survey respondents (N=37) believed gains in IMD knowledge as highly important with exposure to clinical learning cases second (43%). By cohort end, 92% reported large gains in IMD knowledge and clinical learning case exposure in 95%. Other high gains reported include presentation experience, access to resources, and community networking. Six months post-traineeship, 82% of 17 Cohort I and II respondents reported clinical application of gains made. **Conclusion**: eGNA Genetic Nutrition ECHO online traineeship provides quality professional education applicable to IMD practitioner clinic and career needs. The success of this novel program provides a foundation for DOHG-MNP development of more IMD focused learning and training resources.

POSTER PRESENTATIONS
(Alphabetical by Presenting Author)

LESSONS LEARNED FROM THE FIRST 1,000: BUILDING THE BASE TO REACH A DIVERSE COHORT OF 100,000 PARTICIPANTS IN A POPULATION WIDE GENOMIC SCREENING PROGRAM

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[1]Medical University of South Carolina, Charleston, SC; [2]Helix, San Mateo, CA

Background/Objective In 2021, the Medical University of South Carolina (MUSC) partnered with Helix to offer population-level genomic testing for Hereditary Breast and Ovarian Cancer, Lynch Syndrome, and Familial Hypercholesterolemia. We report on lessons learned from the pilot phase of the program and steps for expansion. **Methods** We used a parallel convergent mixed methods design to assess individual factors associated with participation in *In Our DNA SC* program. To monitor participation in the program, we developed a database to track key metrics (e.g., total number of recruitment messages sent, enrollment, number of positive individuals who complete genetic counseling). We also completed qualitative interviews with 20 participants using a semi-structured interview guide. **Results** The pilot phase took place in 10 MUSC-affiliated outpatient clinics between November 2021 and February 2022. A total of 18,887 patients were contacted, 1,027 consented (5.4%). Those who consented were female (74.3%), White (87%), and had a median age of 48.7 years. Qualitative findings reveal three primary concerns about participation in the program: impact of participating on health or life insurance, security of genetic information, and consent form design and content. **Conclusion** Our mixed-methods approach to evaluating the pilot phase of In Our DNA SC provides practical ways to assess barriers and facilitators to implementation. Our team established a system for recruiting through the electronic health record system and tracking key metrics and success indicators. These will continue to be used by the *In Our DNA SC* program and streamline expansion of similar population genomics programs at other institutions.

MATERNAL PHENYLKETONURIA MANAGED BY PALYNZIQ THERAPY

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A 35-year-old, Caucasian female diagnosed with Phenylketonuria by newborn screening with a confirmatory Phenylalanine level of 50 mg/dL, became pregnant while on Palynziq therapy. Patients' medical history includes anxiety, depression, PCOS, seizure disorder, and PKU diet non-compliance. Patient started Palynziq in August of 2020 with initial PHE levels ranging from 15.4 mg/dL to 29.2 mg/dL. Pt responded in November of 2020 with a PHE level of <0.3 mg/dL. Our clinic worked closely with the patient to titrate the Palynziq dose as compared to the amount of protein the patient would reliably consume prior to pregnancy. We then worked with the patient to ensure adequate intakes in calories, protein, and vitamins/minerals throughout her pregnancy, while maintaining her PHE level within the treatment range of 2-6 mg/dL. Patient was able to maintain PHE levels within the treatment range for the majority of her pregnancy. Patient struggled throughout pregnancy with noncompliance to medication dosing, inadequate protein intake, and experienced difficulty with relaying reliable information. The multidisciplinary team worked together to overcome these challenges and we continue to work together to support this patient and her family, as the infant born has also been diagnosed with PKU.

POSTER PRESENTATIONS
(Alphabetically by Presenting Author)

EFFICACY AND SAFETY OF THE RECOMMENDED PEGVALIASE DOSING REGIMEN IN ADULTS WITH PHENYLKETONURIA IN THE PHASE 3 PRISM STUDIES

Sacharow S[1], Northrup H[2], Whitehall KB[3], Rowell R[3], Lindstrom K[3], Bishop E[3], Burton B[4], and Thomas J[5]
[1]Boston Children's Hospital, Harvard Medical School, Boston, MA; [2]McGovern Medical School, University of Texas Health Science Center at Houston, Houston, TX; [3]BioMarin Pharmaceutical Inc., Novato, CA; [4]Lurie Children's Hospital, Northwestern University Feinberg School of Medicine, Chicago, IL; [5]University of Colorado School of Medicine, Aurora, CO

Background*:* Pegvaliase is a blood phenylalanine (Phe)-lowering enzyme substitution therapy approved for adults with phenylketonuria and uncontrolled Phe (>600 µmol/L) on existing management. ***Methods****:* In PRISM-1, pegvaliase-naïve patients with blood Phe >600 µmol/L were randomized 1:1 to 20 or 40 mg/day pegvaliase maintenance dose. Participants continued pegvaliase in PRISM-2 part 4 at 5-60 mg/day at investigator discretion. This subgroup analysis includes patients randomized to and treated with ≥1 dose of pegvaliase 20 mg/day (n=118), reflecting the efficacy population in the updated US label. ***Results****:* Most patients achieved Phe ≤600 µmol/L (91 patients, 77%) and ≤360 µmol/L (86, 73%) by 36 months at <20-60 mg/day. Most patients achieved Phe ≤600 µmol/L by 24 weeks at 20 mg/day (36/44 patients, 82%), 16 weeks at 40 mg/day (18/26, 69%), and 16 weeks at 60 mg/day (8/12, 67%). Phe ≤600, ≤360, and ≤120 µmol/L was achieved by 48%, 42%, and 32% of patients, respectively, at 12 months (n=97), 76%, 66%, and 50% at 24 months (n=86), and 75%, 66%, and 48% at 36 months (n=77). Among 285 patients exposed to a pegvaliase induction/titration/maintenance regimen, common adverse events (AEs) included arthralgia (77%), injection site reaction (66%), injection site erythema (51%), and headache (55%); 44 (15%) patients discontinued treatment due to an AE. Non-IgE-mediated anaphylactic AEs occurred in 29 patients; 6/21 patients rechallenged had a recurrence of anaphylaxis. Types and rates of adverse reactions during maintenance were similar with 20, 40, and 60 mg/day. ***Conclusions****:* Pegvaliase demonstrated sustained and substantial Phe reduction related to treatment duration and dose. Long-term pegvaliase treatment had a manageable safety profile for most patients.

CLINICAL FINDINGS FROM THE LANDMARK *MEF2C*-RELATED DISORDERS NATURAL HISTORY STUDY

Cooley Coleman JA[1,2], Sarasua SM[1], Moore HW[2], Boccuto L[1], Cowan CW[3], Skinner SA[2], and DeLuca JM[1,2]
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MEF2C-related disorders, also known as *MEF2C*-haploinsufficiency, are rare neurodevelopmental disorders caused by alterations or copy number variants of the *MEF2C* gene. These disorders are characterized by developmental and intellectual disability, limited language and walking, hypotonia, and seizures. A recent systematic review identified 117 patients with *MEF2C*-related disorders reported across 43 manuscripts. Despite these reports, the disorder is not easily recognized. We developed a survey based on validated instruments to gather developmental and clinical information from parents of children with the disorder. The survey link was distributed within the "MEF2C Medical Personnel and Families" Facebook group. Seventy-three parents completed the survey. Approximately 40% reported a *MEF2C* variant and about 55% reported a deletion involving *MEF2C*. Both groups had similar clinical presentations. Limited speech (82.1%), seizures (86.3%), bruxism (87.7%), repetitive movements (94.5%), and high pain tolerance (79.5%) were the most prominent features. Developmental milestones were reported by parents, including only eight female subjects able to use a small number of words to communicate (p=0.0033). Here we present the results from our natural history study parent survey, the largest single cohort to date, establishing a comprehensive view of developmental and clinical features for *MEF2C*-related disorders. We also highlight the use of Facebook as a modality to reach families for rare disease research.

POSTER PRESENTATIONS
(Alphabetically by Presenting Author)

PALYNZIQ, IS IT WORTH THE WEIGHT?: Weight gain observed in Palynziq-Treated PKU Patients.
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Background: Palynziq therapy has allowed patients with phenylalanine hydroxylase (PAH) deficiency to significantly liberalize their dietary protein intake. These dietary changes can allow for a more normalized diet, but patients are often ill-prepared to manage this new diet. This may lead to unnecessary weight gain. **Objectives**: To identify weight changes in patients with PAH deficiency after dietary protein liberalization in response to Palynziq therapy. **Methods**: Body weights and BMIs were measured in 13 Palynziq responders (ages 20-46) before first Palynziq injection, throughout titration and maintenance phases and within the last year (1-2 years after first injection). **Results**: 4 of the 13 Palynziq responders (3 female, 1 male) had significant increases in BMI (from normal range to Obese Class 1) and increases in % body weight of greater than 15%. Average age among the 4 participants was 23 years old. Mean BMI of 13 patients at baseline was 29.9 (overweight) and most recent mean BMI increased to 32 (Obese Class 1). Increase in mean body weight ($p=0.01$) and BMI ($p= 0.01$) were statistically significant. **Conclusion**: Patients treated with Palynziq are allowed dietary protein liberalization after response. For patients that have been on a restricted diet their whole lives, they may be unknowledgeable about healthy eating, resulting in weight gain. Nutrition education and counseling are important interventions for patients before their diet is unrestricted and thereafter. Further body weight data should be collected over a longer interval to determine if weight gain is a temporary phase or long-term phenomenon.

IMPROVING BLOOD SPOT QUALITY IN NEWBORN SCREENING: OUTCOMES OF AN ACTION RESEARCH PROJECT
Lowe T[1], Hitt J[2], Taylor A[2], Boyd J[2], Shu L[1], and DeLuca J[1]
[1]Clemson University School of Nursing, Clemson, SC; [2]PRISMA Health-Upstate, Greenville, SC

Newborn screening (NBS) is a public health program for detecting and treating infants with inherited metabolic disorders and other conditions. Barriers to obtaining quality blood spot samples and workflow issues can cause delays in reporting NBS results, thus impeding delivery of lifesaving care. Nurse researchers from Clemson University and nursing and medical staff at PRISMA, a regional medical center in South Carolina, met to discuss areas for improving NBS services. An issue of immediate concern to the team was unsatisfactory NBS blood spot filter paper cards rejected by the South Carolina Public Health Laboratory. An action research project was developed to eliminate deficiencies in the quality of the NBS screening blood spot cards. Ten nursery nurses were recruited for the study (20% of total staff). Blood spot cards were inspected using a checklist to identify problems such as clots or layering of blood. The cards were also photographed and verified for quality by independent reviewers. Data collection occurred between August 2021 to February 2022. A total of 140 blood spot cards were examined. For six months prior to study initiation, unsatisfactory cards averaged 5.32% total per month. During the seven-month study period, unsatisfactory cards averaged 1.88% monthly with a goal of <2%. This sustained reduction in unsatisfactory blood spot cards coincided with practice changes due to blood spot inspection by the study nurses. Action research projects can bring academic and clinical agencies together for prioritizing specific problems, setting goals and improving clinical outcomes.

POSTER PRESENTATIONS
(Alphabetically by Presenting Author)

DIETARY FATTY ACID AND CHOLESTEROL INTAKE CHANGES IN PATIENTS WITH PHENYLKETONURIA (PKU) AFTER ONE YEAR OF SAPROPTERIN-RESPONSIVE DIET LIBERALIZATION

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Background: In PKU, Sapropterin (BH4) can improve dietary (phe)nylalanine tolerance and reduce medical food (MF) dependence, permitting a more liberalized diet. This may alter lipid intakes and potentially impact chronic disease risk. **Objective:** Assess whether diet liberalization in sapropterin responders (SR) affects dietary lipid intakes to better inform long-term PKU dietetic therapy. **Methods:** Registered Dietitians analyzed three-day diet records collected at baseline from sapropterin-naïve PKU patients and one-year later. Sapropterin responders had minimum 20% decrease in plasma phe with observed increases in phe tolerance. Sapropterin non-responders (SN) maintained standard diet therapy throughout. Diet lipid markers included summed intake (g/day and % kcal) of saturated, mono-, poly-unsaturated, and trans-fatty acids including linoleic, linolenic, EPA, DHA, medium chain (C6-C12), and cholesterol. Parametric and non-parametric analyses were completed as relevant in SPSS 28.0. **Results:** 10 SR and 14 SN, males and females, age 4-50 years, provided diet records at both time points. SR had improved phe tolerance with minimal change to reported dietary phe due to high baseline intake; an overall 59% decrease in reported MF intake occurred along with significant decreases to trans-fat (P=0.011) and kcal/day (P=0.062)). SR and SN both increased dietary cholesterol intake, of clinical significance. No other dietary lipid changes were noted. **Conclusion**: One-year diet liberalization in PKU SR led to decline in kcal and trans-fat intake, with minimal impact otherwise. Cholesterol intake increased regardless of sapropterin status. Sources of cholesterol and trans-fats in PKU patient diets deserve further attention and periodic assessment relevant to chronic disease risk.

TRIHEPTANOIN STABILITY IN FOODS, FORMULAS, AND EMULSION

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Triheptanoin is an FDA-approved treatment for patients with long-chain fatty acid oxidation disorders (LC-FAOD). Triheptanoin is administered enterally or orally and is mixed with either beverages, standard foods, or medical foods (metabolic formula, including single nutrient modulars), to provide propionyl-CoA as an anaplerotic and gluconeogenic energy source in addition to acetyl-CoA. The purpose of this research was to test the chemical and physical stability of triheptanoin when combined with beverages, foods, and medical foods often consumed by patients with LC-FAOD. The chemical stability of triheptanoin was evaluated using gas chromatography under the following conditions: mixed with skim milk or applesauce, baked in muffins, and as part of a formula recipe using protein and carbohydrate single nutrient modules. Visual observations monitored the stability of triheptanoin in additional mixtures over time. No significant increases of related impurities or differences in content of triheptanoin were observed when mixed with beverages or foods for up to 4 hours at 25°C and 40°C or when held for 48 hours at 2°C to 8°C, or when baked in muffins at 200°C and held for 7 days. Triheptanoin is a liquid formulation recommended to be mixed with beverages or foods to reduce gastrointestinal side effects. This study showed stability of triheptanoin in different beverages and foods, and when used in baking. In conclusion, chemical and/or physical stability of triheptanoin in combination with representative beverages and foods was demonstrated. These findings inform dietitians, patients, and caregivers and broadens the options for administration of triheptanoin to patients with LC-FAOD.

POSTER PRESENTATIONS
(Alphabetically by Presenting Author)

BRIDGING THE GAP IN ACCESS TO FILTER PAPER MONITORING IN PATIENTS WITH PHENYLKETONURIA – A MEDICAL NUTRITION THERAPY FOR PREVENTION (MNT4P) PROGRAM INITIATIVE

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Background: Filter paper (FP) or dried blood spot testing is the preferred method of monitoring blood levels of phenylalanine and tyrosine for patients diagnosed with phenylketonuria (PKU) in the state of Georgia. When a local specialty laboratory abruptly ended FP testing in September 2020, an emergent alternative plan became essential to prevent potential disruptions in patient care while working on a sustainable solution for PKU monitoring, especially given the ongoing COVID-19 pandemic. **Method:** Emory's in-house laboratory was not contracted with outside laboratories to process FP testing and bill insurance. To mitigate any delays in FP testing, the MNT4P program selected ARUP Laboratories to perform PKU FP testing. Customized FP cards and business reply envelopes were developed and distributed in collaboration with PerkinElmer, Emory Mail Services, and the United States Postal Service. Patient outreach efforts were facilitated through email campaigns, MNT4P website updates, and in collaboration with Georgia PKU Connect. **Results:** 95 patients were referred to MNT4P program for FP paper monitoring. A total of 239 FPs were processed in 4 months. FP testing was successfully transferred from the MNT4P program to Emory's in-house laboratory. **Conclusion:** The MNT4P program successfully worked with Emory's in-house laboratory to develop a sustainable solution for FP monitoring. It prevented interruption in long-term follow up of patients with PKU. MNT4P continues to be the payor of FP tests for uninsured and underinsured patients.

A FAMILY REVIEW OF PHENOTYPIC SPECTRUM ASSOCIATED WITH THE INTERSTITIAL DUPLICATIONS AT 4Q31.1 AND/OR 16P13.3

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Individuals with 4q31 or 16p13.3 duplications were frequently reported to have variations in the clinical presentation. While 4q31 duplications were not reported with syndromic phenotypic patterns, there is a 16p13.3 duplication syndrome featuring the essential involvement of the *CREBBP* gene in addition to the phenotypic spectrum, including developmental delay, intellectual delay, ADHD, and autistic features, etc. Most previous reports were based on unassociated individuals or a few family members, which may better represent the phenotype-genotype correlation in individual cases, while the more complex genetic and environmental factors could potentially complicate the cross-review of reports from various sources. Here we reviewed a family inheriting the interstitial duplications at 4q31.1 (267 kb, including *MAML3* and *SCOC*) and/or 16p13.3 (515 kb, including *RBFOX1*) involving nine individuals in three generations. Out of nine individuals in the family, four only have the 4q31.1 duplication, one only has the 16p13.3 duplication, and the remaining four carry both duplications. The family has shown a wide spectrum of phenotypes, including bipolar, anxiety, depression, and autism spectrum disorders, learning disabilities, ADHD, developmental and/or motor delays, feeding difficulty, congenital heart defects, and failure to thrive. Family members having ADHD, autism, developmental delay, feeding difficulty, congenital heart defects, and failure to thrive only had the 4q31.1 duplication, but not the 16p13.3 duplication. The members with only 16p13.3 duplication or with both duplications had the remaining phenotypes. In summary, this uncommonly large family review at the present time could help us further understand these duplications from a clinical perspective.

POSTER PRESENTATIONS
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INTERSTITIAL 12P DELETION SPANNING THE ABCC9 GENE PRESENTING WITH VENTRICULAR FIBRILLATION PHENOTYPE: A CASE REPORT

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Deletions in the short (p) arm of chromosome 12 are rare structural abnormalities. Till now only thirteen patients have been reported. We describe the case of a 24 y.o. female with 12p12.2p11.22 deletion, who has typical features of 12p interstitial deletion, which include microcephaly, global developmental delay, short stature, craniofacial dysmorphism, brachydactyly and optic nerve hypoplasia. At age 18, the patient had sudden cardiac arrest in her home and underwent resuscitation. She was found to be in ventricular fibrillation by the time EMS arrived. The patient underwent automatic implantable cardioverter-defibrillator placement and followed by cardiologist. She was noted to have frequent PVCs, non-sustained V-tach, mitral valve prolapse and dilated aortic root. These cardiac findings haven't been reported among interstitial 12p deletion patients. Among 40 genes involved in this deleted region, the *ABCC9* gene encodes the potassium channel subunit of the sulfonylurea receptor 2. Gain-of-function mutation *ABCC9* gene has been reported associated with Brugada Syndrome and Early Repolarization Syndrome. However, the significance of *ABCC9* deletion to the function of the heart is unknown. All reported cases showed structural heart defects, not cardiac arrhythmia. And this is the first case reported to date with interstitial 12p deletion with cardiac arrhythmia and cardiac arrest. These *findings possibly expand the phenotypic* spectrum of interstitial 12p deletion.

PTC PINPOINT CP SPECTRUM: A SPONSORED NO-COST 265-GENE PANEL FOR PATIENTS WITH SYMPTOMS SUGGESTIVE OF CP AND ABSENCE OF RISK FACTORS FOR AN ACQUIRED BRAIN INJURY

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Objective: Cerebral palsy (CP) is one of the most common neurodevelopmental disorders affecting 2-3/1,000 livebirths. Studies have found that 10-30% of cases have a genetic etiology. Diagnostic yield is increased in patients without an obvious cause, such as an acquired brain injury. Identifying a genetic etiology has a significant impact on clinical management decisions. We report the early utilization patterns and initial molecular diagnostic yield of a North American based, targeted, no-cost to patients sponsored gene panel program, PTC Pinpoint CP Spectrum. Methods: Program eligibility criteria: (I) symptoms suggestive of CP, (II) absence of risk factors for an acquired brain injury. Gene curation focused on genes associated with clinical phenotypes consistent with cerebral palsy. Physician-reported clinical history was collected. Diagnostic yield was calculated from results of tests ordered between 9/15/2020 (program inception) and 3/18/2021. Results: 38/406 (9%) patients had a genetic cause of CP identified. There were causative variants identified in 21 different genes, with *CTNNB1* being the most common cause in 8 patients. Providers from over 9 different specialties have utilized the panel. Age at testing varied greatly (ages 0-74) with most patients younger than 16 years. Conclusion: The PTC Pinpoint CP Spectrum panel is a feasible tool for a variety of providers that can identify the underlying genetic cause for patients with CP of unknown etiology. The diagnostic yield is expected to improve with continued gene curation. This no-cost to patients sponsored program can be part of a tiered diagnostic approach for patients with CP.

POSTER PRESENTAIONS
(Alphabetically by Presenting Author)

RESULTS OF MOLECULAR GENETIC AUTOPSIES IN FLORIDA

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Sudden deaths occur from birth to young adulthood, often with normal autopsy and toxicology screen. Mutation analysis on post-mortem DNA is a molecular autopsy (MA) and identifies pathogenic mutations. Genetic conditions not having morphological markers are identified by MA. We present results of MA from Florida. We use dried blood spot (DBS) specimens to simplify collection and lower costs. We use targeted Whole Exome Sequencing (tWES) to identify mutations in genomic DNA from DBSs. These are enriched for coding regions, splice site junctions, and a custom bait-capture system utilizing paired end sequencing on Ilumina platform. Reads assembled and aligned to reference sequences based on NCBI RefSeq transcripts and human genomic GRcH37/UCSC with data filtered and analyzed with variant calling by OrionSeek. OrionSeek is limited to genes relevant to phenotype. Re-analysis for other variants is performed if requested or phenotype changes. Challenge using tWES is finding causal pathologic variants. Filtering genes associated with clinical picture shifts focus from entire exome to parts interpretable in diagnostic setting. Among specimens screened from 7 Florida MEs. 15/19 had pathological mutations. Conditions and mutations identified were: Paragangliomas Syndrome-3 *(SDHC*)(77delA); Loeys-Dietz Syndrome (*TGFBR1*)(1400G>A); two Long QT Syndrome 3 &12 (*SNTA*)(497-5A>G) and (*SCN5A*)(4475A>G); 4 Dilated Cardiomyopathies 1G (*TTN*)(38660del); 1hh (*BAG3*)(1259C>T), 1jj (*LAMA*)(5194C>T), MM (*MYBPD3*)(1227-7C>T); twins with Immunodeficiency-11B with Atopic Dermatitis (*CARD11*)(2984C>T); Arrhythmogenic Right Ventricular Dysplasia-2 (*RYE2*)(2573C>T); two Hypertrophic Cardiomyopathy 4 & 22 (*MYBPC3*)(1227-7C>T) and (*MYPN*)(601G>A); Developmental & Epileptic Encephalopathy 11 (SCN2A)(3686_3702del).

A NOVEL HOMOZYGOUS TRUNCATING VARIANT IN *SYNJ1* CAUSING DEVELOPMENTAL AND EPILEPTIC ENCEPHALOPATHY 53 IN AN AFRO-CARIBBEAN INDIVIDUAL

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SYNJ1 encodes synaptojanin-1, a poly-phosphoinositide phosphatase that is expressed in brain to regulate synaptic vesicle dynamics in neurons. Biallelic variants in *SYNJ1* cause a spectrum of clinical manifestations. Predicted *SYNJ1* loss of function tends to be associated with developmental and epileptic encephalopathy (OMIM 617389). Biallelic missense variants may cause a less severe phenotype with early onset parkinsonism. Disorders associated with pathogenic *SYNJ1* variants are rare and, as such, a paucity of reports are found in the literature. We present a 14-year-old Afro-Caribbean girl who had uncontrollable seizures soon after birth. Proband-only exome sequencing showed that she had a homozygous c.242-2A>G pathogenic variant in *SYNJ1*. This variant is predicted to affect the splice site of an intron near the 5' end of the gene to affect the Sac1 phosphatase domain. Sanger sequencing confirmed the variant and showed that both parents were heterozygous carriers. Her older sister had a similar presentation, but she was not observed. Both siblings died at age 16. The family is from an isolated resource limited island in the Lesser Antilles region of the Caribbean. This case expands the knowledge of the allelic heterogeneity in *SYNJ1* and the clinical presentation of disorders associated with this gene.

POSTER PRESENTATIONS
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MANAGEMENT AND SYMPTOMS OF PEOPLE LIVING WITH LONG-CHAIN FATTY ACID OXIDATION DISORDERS (LC-FAOD) IN THE UNITED STATES: RESULTS FROM THE LC-FAOD ODYSSEY STUDY

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Background: Data are limited for real-world management and outcomes in patients with long-chain fatty acid oxidation disorders (LC-FAOD). The LC-FAOD Odyssey study uses a patient-centered design to collect prospective and retrospective medical record data and prospective patient- and caregiver-reported outcomes (PROs) from consenting patients to assess the real-world impact of LC-FAOD. **Methods:** This non-interventional cohort study extracts patient data using the Picnic Health digital platform. All patients and caregivers of patients <18 years provided informed consent, with additional assent for children 8 to 17 years. Collected data are anonymized. The study is HIPAA-compliant/IRB-approved. **Results:** As of November 2021, 39 patients are enrolled, with 27 included in this analysis. Sixteen (59.3%) and seven (25.9%) reported current triheptanoin and MCT use, respectively. All respondents reported at least one additional management strategy when well, such as restricting dietary fat (91.3%) and carnitine supplementation (69.6%). All patients reported needing intervention at home to prevent an ER/hospital visit: overall, 2.35 times in the previous 4 weeks (median:0.5), 0.7 times (median:0.5) for current triheptanoin vs 5.5 times (median:0.5) for current MCT. Reported intervention strategies when ill included drinking more fluids (96.2%), consuming high sugar food/drink (92.3%), and resting (92.3%). All patients (n=25) experienced rhabdomyolysis, mental fatigue, and the need to limit exercise, with the latter two the most impactful reported symptoms. **Conclusions:** PRO data indicated patients with LC-FAOD employ multiple disease management strategies, with frequent interventions to prevent ER visits. Patients currently on triheptanoin reported needing less frequent ER/hospital-preventive interventions compared with patients currently managed on MCT.

CARNITINE DEFICIENCY: A CASE REPORT OF AN ADULT FEMALE PRESENTING WITH HYPERAMMONEMIC ENCEPHALOPATHY

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Liver failure or cirrhotic liver disease is the most common cause of hyperammonemia in adults. Among non-hepatic etiologies, urea cycle defect accounts for approximately 4%. We report a 22-year-old woman presented with hyperammonemic encephalopathy who was initially thought to have Ornithine transcarbamylase (OTC) deficiency. She had a history of learning disability, anxiety and depression when she presented to the ER with fever, nausea, vomiting and diarrhea. Labs were notable for elevated ammonia at 581 mcmol/L, high anion gap metabolic acidosis, hypoglycemia and elevated PT/INR without significant elevation of AST, ALT and bilirubin. The patient was treated with hemodialysis, lactulose and rifaximin. Plasma amino acid analysis (PAA) on day 2 of admission showed absent citrulline and low Arginine, which was suggestive of OTC deficiency. The patient was then started on arginine, ammonul, citrulline, buphenyl, and protein restricted diet. However, PAA result which drawn at the time of admission revealed normal citrulline and arginine. Molecular analysis was negative for urea cycle defects. Ammonia was normalized on day 4 of admission. However, plasma total and free carnitine were extremely low: free carnitine 2 µmol/L (ref 20-55) and total carnitine 3 µmol/L (ref 27-73). Molecular analysis was also negative for carnitine uptake deficiency and other fatty acid oxidation disorders. Carnitine deficiency was thought to be the cause of hyperammonemic crisis in this case. The patient has avoided meat in her diet, which lead to her carnitine deficiency. This case highlights the importance to have carnitine deficiency in the differential diagnosis in adults with hyperammonemia.

POSTER PRESENTATIONS
(Alphabetically by Presenting Author)

WHEN A BRAIN CANCER IS NOT: A CASE OF FRAGILE X-ASSOCIATED TREMOR ATAXIA SYNDROME

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A 54 y/o man presented with positional/intention hand tremor, and dysmetria, worse on the left. Imaging revealed a 6mm lesion in his left cerebellum. He was given medical therapy with unsatisfactory response. At age 56 he underwent deep brain stimulation (DBS), but as he tapered off his medications the tremor worsened. New imaging revealed his lesion had grown to 1 cm, prompting concern for a low-grade glioma (LGG). At age 57 he underwent a left retrosigmoid craniotomy and frozen tissue analysis was consistent with LGG. However, anatomic pathology review showed mildly hypercellular white matter, mild gliosis, and minimal cytologic atypia; with spherical, eosinophilic inclusions positive for ubiquitin and p62 found in the nuclei of scattered astrocytes and some of the presumably glial cells of the granular layer. The final pathologic diagnosis was Fragile X-associated ataxia tremor syndrome (FXTAS), prompting evaluation by Medical Genetics. Mild difficulty with recent memory recall was endorsed by the patient and executive dysfunction was reported by his wife. A three-generation pedigree was obtained, and no relevant FMR1-related symptoms such as ovarian insufficiency, early menopause, movement disorder, autism, or intellectual disability were reported; albeit family structure was limited. *FMR1* analysis via repeat-primed PCR identified a hemizygous 97 repeat, non-methylated CGG trinucleotide expansion, confirming the diagnosis of FXTAS. The patient was advised to turn off his DBS and continue follow-up with neurology for medical management. Patient was counseled on the possibility of FMR1-related disorders in at-risk family members.

OUTCOMES FROM 2.5 YEARS OF GENETIC COUNSELING WITH AN ADULT NEUROMUSCULAR CLINIC: A RETROSPECTIVE REVIEW

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Optimal care for patients with neuromuscular conditions can be achieved with access to a genetic counselor (GC). Here we present a retrospective review of patients evaluated from October 2019 to April 2022 by a GC through the Prisma Health-Upstate Adult Neuromuscular Clinic. We used descriptive statistics to assess referral indications, test selection, diagnostic outcomes, and patient demographics. Out of the 382 unique patients evaluated through the clinic over the past 30 months, 77 were offered an evaluation or had access to a GC. Of these 77 patients, 38 received confirmatory diagnoses with genetic testing, 5 received an alternative diagnosis, and 27 remain without a genetic diagnosis. The most frequent indications evaluated were: Charcot-Marie-Tooth disease, muscular dystrophies, and idiopathic peripheral neuropathy. Most patients were White (90.1%) between the ages of 35 and 59 years old and lived within 45 miles of the clinic. Three patients were referred to new specialists due to their genetic diagnosis. One patient was specifically referred for enzyme replacement therapy (Late-onset Pompe disease). Genetic testing was mostly free to patients through sponsored testing programs. Service delivery models included: traditional pre-/post-test counseling, in-person consults, and e-consults. The findings from this study demonstrate the downstream benefits of access to a GC in the early stages of diagnosis, and later for reproductive counseling. This study sustains support for the federal recognition of GCs as billable healthcare professionals and may also inform future directions in assessing the role of genetic counseling in the prevention of neurologic disease.

PATIENT-CENTERED NUTRITION MANAGEMENT AND EDUCATION OF THREE INFANTS DIAGNOSED WITH AND SUCCESSFULLY TREATED FOR ISOVALERIC ACIDEMIA (IVA)

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Background: IVA is an inborn error of leucine catabolism caused by isovaleryl-CoA dehydrogenase (IVD) deficiency, resulting in the accumulation of isovaleric acid metabolites. Without nutrition intervention, symptoms can be severe and even lead to death in the acute neonatal form. Dietary management aims to reduce metabolite accumulation by restricting dietary leucine, preventing catabolism, and promoting excretion of non-toxic metabolites through glycine and carnitine supplementation. **Methods**: This case series summarizes three unrelated patients with IVA. Screening, confirmatory, and molecular testing data were collected. Inpatient dietary treatment was implemented. MNT4P program's dietitian provided nutrition education via sequential telemedicine sessions with an in-person interpreter and dietitian present. Caregivers received nutrition education documents. MNT4P secured access to medical foods and supplementations prior to discharge. Patients were seen in the outpatient setting for follow-up. **Results**: Patients presented with hyperammonemia, hypothermia, and acidosis at 5, 6, and 7 DOL. Patients' C5 levels were 9.5-15.5 uM/L (<0.54 for birthweight (BW) ≥2500 grams) and C5/C3 ratios 6.4-7.6 (<0.48 for BW ≥2500 grams) upon newborn screening. Confirmatory testing of infants revealed elevated plasma C5 and the presence of urine isovalerylglycine. All were homozygous pathogenic for c.358C>T in the IVD gene. Caregivers spoke a rare Central American dialect; interpretation was successful as parents expressed good understanding. Established medical food access through WIC, and a contracted pharmacy delivered single-dose carnitine and glycine prescriptions to patients' homes. All patients were doing well at follow-up due to frequent diet adjustments and collaboration with local pediatricians. **Conclusions**: These cases highlight the need for programs to provide culturally sensitive, cumulative nutrition education, preparation for home discharge and follow-up plan, and collaboration with local providers to better manage complex IMDs for improved outcomes.

PLATINUM EXHIBITORS

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Our mission is to reduce the impact of extremely rare and devastating diseases by providing urgently needed therapies. We work side-by-side with rare disease communities to increase awareness, improve diagnosis, and expand availability of treatments for people with rare diseases.

222 Berkeley Street
Suite 1200
Boston, MA 02116
(954) 551-0911
Rhythmtx.com
Contact: Randy Ziss
rziss@rhythmtx.com

Rhythm is a bio-pharma company engaged in developing peptides to address rare genetic diseases of obesity. It partners with Prevention Genetics to offer free genetic testing using a 79 gene obesity panel which includes microdeletions in 16p11.2. Rhythm engages in clinical trials to advance our understanding of how patients with genetic variants suspected of causing genetic obesity respond based on measure focused on weight loss and hyperphagia improvement.

3611 Valley Centre Drive, Suite 300
San Diego, CA 92130
(619) 504-9843
Travere.com
Contact: Heather Farr
Heather.farr@travere.com

Travere Therapeutics is a biopharmaceutical company dedicated to identifying, developing and delivering life-changing therapies to people living with rare disease.

SILVER EXHIBITORS

60 Leveroni Court
Novato, CA 94949
(919) 656-9660
Ultragenyx.com
Contact: Geoffrey Simken
gsimken@ultragenyx.com

Our goal is to provide medicines to those with limited options and to help patients face rare diseases head on, with courage and confidence.

1671 Worcester Road
Suite 300
Framingham, MA 01701
(508) 209-2090
Variantyx.com
Contact: Erika Velazco
Erika.velazco@variantyx.com

Variantyx is a technology-driven precision medicine company providing state-of-the-art diagnostic solutions for the rare genetic disorders and reproductive genetics markets, and treatment optimization in oncology.

EXHIBITORS/SUPPORTERS

Acer Therapeutics 100 NW Wall Street Suite 220 Bend, OR 97703 (704) 560-0019 Acertx.com Contact: Jerry Main jmain@acertx.com Acer Therapeutics Inc., a clinical stage pharmaceutical company is focused on the acquisition, development and commercialization of therapies for serious rare and life-threatening diseases with significant unmet medical needs.	**LabCorp-Pediatric Rare Disease** 531 S. Spring Street Burlington, NC 27125 (888) 522-2677 Labcorp.com Contact: Kimberly Mascaro mascark@labcorp.com LabCorp is a leading global life sciences company that provides vital information to help doctors, hospitals, pharmaceutical companies, researches and patients make clear and confident decisions.
Ajinomoto Cambrooke 4 Copleland Drive Ayer, MA 01432 (978) 501-6255 Cambrooke.com Contact: Erin Murphy emurphy@cambrooke.com A full line of metabolic products will be available for review and tasting. Glytactin ready to drink, Build, Bettermilk, and restore.	**PreventionGenetics** 3800 S. Business Park Ave Marshfield, WI 54449 (715) 387-0484 Preventiongenetics.com Contact: Aija Kopca Aija.kopca@preventiongenetics.com PreventionGenetics provides tests for nearly all clinically relevant genes. These tests include our powerful and comprehensive whole genome sequencing test, PGnome®.
Greenwood Genetic Center 106 Gregor Mendel Circle Greenwood, SC 29646 (864) 388-1734 Ggc.org Contact: Caroline Pinson cpinson@ggc.org The Greenwood Genetic Center is a nonprofit institute organized to provide clinical genetic services, diagnostic laboratory testing, educational resources and research in the field of medical genetics.	**PTC Therapeutics** 100 Corporate Court South Plainfield, NJ 07080 (484) 557-7977 Ptcbio.com Contact: Jennifer Coyle jcoyle@ptcbio.com As a science-driven, global biopharmaceutical company, we combine our strong clinical and scientific expertise with dedication to using groundbreaking science and new technologies to find innovative ways to treat these diseases which can give patients and their families more moments.

EXHIBITORS/SUPPORTERS

Southeast Regional Genetics Network (SERN)
101 Woodruff Circle, 7th Floor
Suite 7130
Atlanta, GA 30322
(404) 778-8626
Southeastgenetics.org
Contact: Theresa Pringle
Theresa.pringle@emory.edu

The Southeast Regional Genetics Network (SERN) is an HRSA sponsored program that focused on improving health equity and health outcomes in individuals with genetic conditions.

Spark Therapeutics
3737 Market Street
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Sparktx.com
Contact: Paul Blore
Paul.blore@sparktx.com

Spark Therapeutics is committed to developing potential gene therapies for serious genetic diseases and bringing those investigational therapies to patients. One of our areas of research is Pompe disease, a lysosomal storage disorder and neuromuscular disease resulting from a mutation in the acid alpha-glucosidase (GAA) gene.