NEWSLETTER

This newsletter centers on reproductive topics with a genetics focus. If there is an organization or upcoming webinar you'd like me to include in a future newsletter, please feel free to reach out at genetics@modernreproduction.org.

Sign up for the newsletter here

Webinars

COLORADO GENETIC COUNSELORS SYMPOSIUM

Oncology Genetics Focus

Sept 22, 2023 | 10 - 6:30 pm ET / 8 - 4:30pm MNT

Register

SMALL CHANGE: IS IT TIME TO RECONSIDER COMPENSATION FOR GAMETE DONORS?

Sept 20, 2023 | 12:30 - 1:30 pm ET / 5:30 BST

Register

NON-INVASIVE PRENATAL SCREENING FOR SINGLE GENE DISORDERS

Sept 20, 2023 | 1pm ET

Register

ISSUE 12

NEWSLETTER

The little lit review

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Screening Embryos for Polygenic Conditions and Traits: Ethical Considerations for an Emerging Technology

Cengiz Cinnioglu, Ph.D., Heather Glessner, M.S., Amy Jordan, M.S., Sydney Bunshaft, M.S.

Yes, another article on preimplantation genetic testing for polygenic conditions (PGT-P), but this one focuses not on the public's opinion but on professional individuals and groups. Interestingly, the article employs the term "polygenic embryo screening" (PES) instead of PGT-P to prevent conflating the test with other PGT offerings, such as testing for aneuploidies (PGT-A) or monogenic conditions (PGT-M). One of the labs that offers PGT-P uses “Embryo Health Score test”.

How a test is positioned to a patient can depend on whether they chose to select it or not. Language about the test influences the decision as well. The goal is always informed consent, but as articles discuss, there are many factors that can infringe on the ability to attain all 4 components of informed consent: understanding, voluntary, capacity to make a decision, disclosure.

The article discusses the following areas of concern for PES:

1. Clinical utility - Advocates for the screen have emphasized that for some risks predicted by PES, they can be comparable to those associated with select pathogenic variants that PGT-M may consider acceptable. For instance, BRCA1 pathogenic variants do not conclusively determine disease, but rather predict an increased risk for cancer. Similarly, PES centers on the risk of disease, not its definitive prediction. However, the authors still harbor concerns regarding the statistical limitations and application of the screen. In alignment with this, there has been limited to no research conducted during the preimplantation period for these conditions, and extrapolation from adult GWAS studies to this developmental stage remains uncertain.
2. Eurocentrism - PES predominantly relies on GWAS studies from the European population and may not be as applicable to those with different ancestral backgrounds.
3. Paradox of choice - With the ability to assess for numerous disease risks, individuals may become overwhelmed with choices. This is an intriguing point, as even with PGT-A screening alone, the paradox of choice comes into play. For example, how should a patient navigate the selection of a mosaic result for trisomy 8 as opposed to another mosaic result for trisomy 10, especially if they have the same morphology grade?
4. Stigmatizing of conditions - There's an implicit bias associated with testing for the conditions on the panel, and this may lead to downstream stigmatization of individuals with these conditions.
5. Eugenics versus procreative autonomy argument is discussed here. Diana Fleischman has this conversation over on substack.

NEWSLETTER

The little lit review

Incidence of sex chromosome aneuploidy in a prenatal population: 27-year longitudinal study in Northern Italy

C A Samango-Sprouse, F R Grati, M Brooks, M P Hamzik, K Khaksari, A Gropman, A Taylor, F Malvestiti, B Grimi, R Liuti, S Milani, S Chinetti, A Trotta, C Agrati, E Repetti, K A Martin

"WHO:
CVS, karyotype results from from public and private centers in Italy from 1995 to 2021 were collected.

WHY:
To determine population data trends regarding the frequency of prenatal diagnostic testing and the identification of SCA, and compare with the changes in indication for prenatal diagnostic tests and available screening options.

FINDINGS:
Over a period of 27 years, there were 13,939,526 recorded births and 231,227 invasive procedures were performed, resulting in the prenatal diagnosis of 933 SCAs.

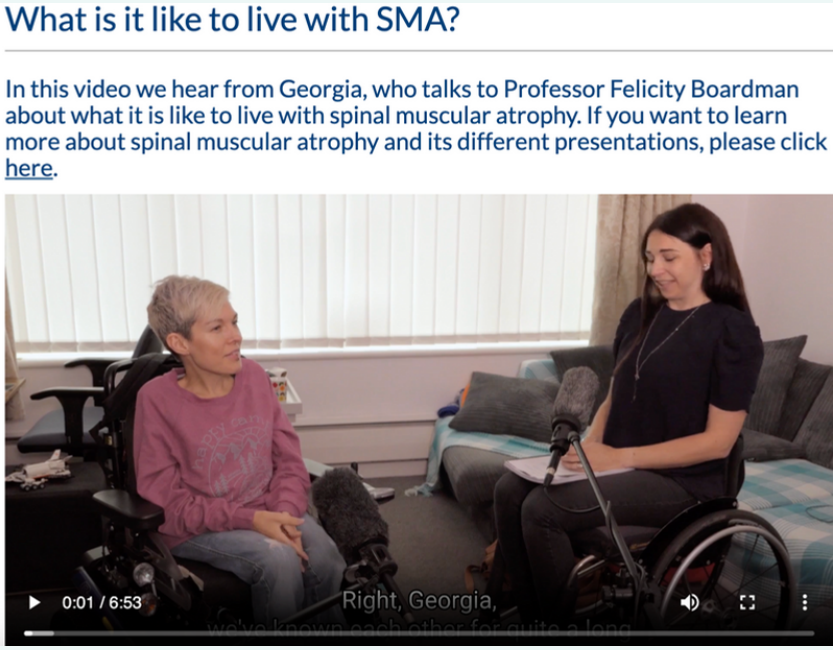
The authors found that the inclusion of SCA in prenatal cfDNA screening tests can increase the prenatal diagnosis of affected individuals. As the benefits of early ascertainment are increasingly recognized, it is essential that healthcare providers are equipped with comprehensive and evidence-based information regarding the associated phenotypic differences and the availability of targeted effective interventions to improve neurodevelopmental and health outcomes for affected individuals."

This article reminds me of the wealth of information provided by Dr. Carole Samango-Sprouse on why early identification matters for sex chromosome trisomies through one of Natera's webinars. Living with XXY has a list of helpful organizations per state for those diagnosed with XXY.

NEWSLETTER

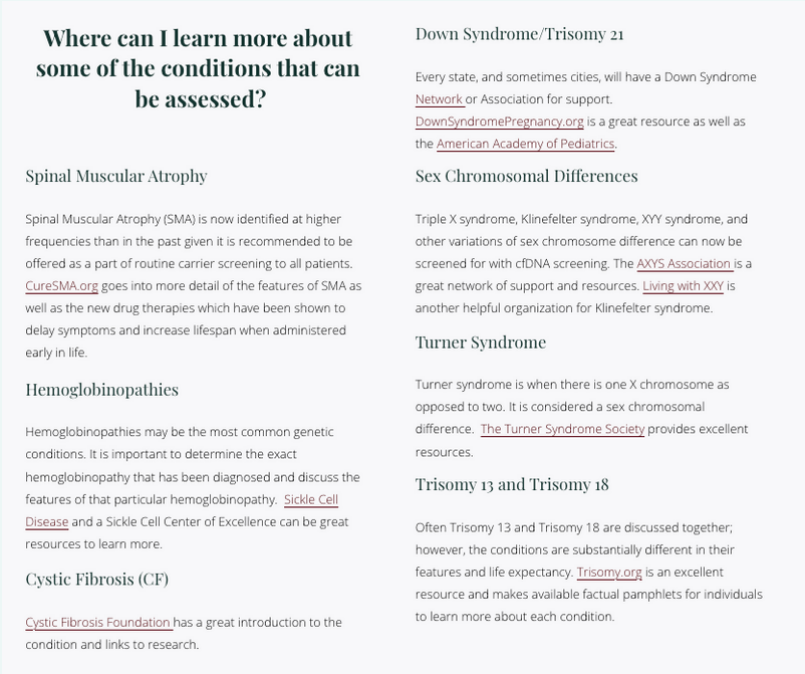
Community Content:

Support organizations content and individual's perspectives should be required curriculum in school. I am endlessly learning from others. Social media has helped to show the lives of many different people with various backgrounds and health conditions. This video is on Warwick's medical school's page. It is great to be able to turn to a professional website for this important perspective as well.



Modern Reproduction Content:

On Modern Reproduction's page for navigating testing in pregnancy, there are links out to patient organizations which I think are as, if not more, informative than sites such as Medline Plus for the general population. While Medline Plus has great content, especially for me to quickly understand a genetic condition, resources by the individuals' with the condition are invaluable. I hope to improve those resources on MR's site though! Any suggestions are welcomed :)



Where can I learn more about some of the conditions that can be assessed?

Spinal Muscular Atrophy

Spinal Muscular Atrophy (SMA) is now identified at higher frequencies than in the past given it is recommended to be offered as a part of routine carrier screening to all patients. CureSMA.org goes into more detail of the features of SMA as well as the new drug therapies which have been shown to delay symptoms and increase lifespan when administered early in life.

Hemoglobinopathies

Hemoglobinopathies may be the most common genetic conditions. It is important to determine the exact hemoglobinopathy that has been diagnosed and discuss the features of that particular hemoglobinopathy. Sickle Cell Disease and a Sickle Cell Center of Excellence can be great resources to learn more.

Cystic Fibrosis (CF)

Cystic Fibrosis Foundation has a great introduction to the condition and links to research.

Down Syndrome/Trisomy 21

Every state, and sometimes cities, will have a Down Syndrome Network or Association for support. DownSyndromePregnancy.org is a great resource as well as the American Academy of Pediatrics.

Sex Chromosomal Differences

Triple X syndrome, Klinefelter syndrome, XYY syndrome, and other variations of sex chromosome difference can now be screened for with cfDNA screening. The AXYS Association is a great network of support and resources. Living with XXY is another helpful organization for Klinefelter syndrome.

Turner Syndrome

Turner syndrome is when there is one X chromosome as opposed to two. It is considered a sex chromosomal difference. The Turner Syndrome Society provides excellent resources.

Trisomy 13 and Trisomy 18

Often Trisomy 13 and Trisomy 18 are discussed together; however, the conditions are substantially different in their features and life expectancy. Trisomy.org is an excellent resource and makes available factual pamphlets for individuals to learn more about each condition.