Clinical Utility of Expanded Carrier Screening: Results-Guided Actionability and Outcomes
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Disclosures: All authors are current or former employees of Myriad Genetics, Inc.

STUDY OBJECTIVES
- Serious recessive and X-linked conditions affect an estimated 1 in 300 pregnancies.1 However, universal screening for only the two conditions recommended by current guidelines, cystic fibrosis and spinal muscular atrophy (SMA),2,3 misses nearly 70% of carriers of rare disease3 and fails to detect up to 94% of pregnancies affected with profound and severe conditions, depending on ethnicity.2
- Expanded carrier screening (ECS), i.e., testing reproductive partners’ carrier status for a large number of recessive and X-linked conditions without regard to ethnicity, addresses this gap.
- ACOG recognizes ECS as an acceptable strategy for carrier screening4, and, along with several other medical societies, acknowledges the unique benefits and considerations of ECS.5
- When ECS is undertaken during the preconception period, results enable interventions to reduce the risk of affected pregnancies, such as in vitro fertilization (IVF) with preimplantation genetic testing for monogenic conditions (PGT-M), use of donor gametes, adoption, avoidance of pregnancy, and if or when pregnancy occurs, prenatal diagnostic testing to determine if the pregnancy is affected. When ECS is undertaken during the prenatal period, results enable prenatal diagnostic testing and informed pregnancy management.
- Here, we describe the impact of ECS results on planned and actual pregnancy management among couples identified as at risk by ECS during the preconception or prenatal period.

METHODS
- A database of more than 270,000 individuals screened by Counsyl (now Myriad Women’s Health) for up to 176 conditions was analyzed to identify couples carrying pathogenic, autosomal recessive variants in the same gene or females carrying X-linked variants at risk (couples identified as at risk by ECS during the preconception or prenatal period, hereafter referred to as ARCs). ARCs were invited to complete a survey, 391 ARCs responded (Figure 1A).
- An online survey was emailed to ARCs. Flow of survey was: (1) condition(s) for which current or future pregnancy was at risk; (2) pregnancy status; (3) actions pursued or planning to pursue; (4) status and actions planned/pursued for subsequent pregnancies after receiving ECS results; and (5) demographic questions (Figure 1B).