Genetics Uncoded:

NxGen MDx

Facts about

FMR1-Related Disorders (including Fragile X)

What Your Test Results Mean

Risk for offspring with *FMR1*-related disorders such as Fragile X is dependent on the length of the segment of your DNA known as the CGG triplet repeat. Individuals who are carriers of a premutation may require additional testing known as AGG interruption analysis, which can further define risk to have a child with Fragile X.

Fragile X Explained

Approximately 1 in 4,000 males and 1 in 8,000 females have Fragile X (>200 CGG repeats). The majority of males with Fragile X have a significant intellectual disability. The spectrum ranges from learning disabilities to severe mental retardation and autism. About one third of the females with Fragile X Syndrome have a significant intellectual disability. Others may have more moderate or mild learning difficulties

NxGenMDx, LLC
801 Broadway Ave NW, Suite 203
Grand Rapids, MI, 49504
Revised 12/15/16

FMR1 Intermediate Allele Carriers

FMR1 intermediate allele carriers (those with 45 to 54 CGG repeats) are NOT at an increased risk to have a child with Fragile X; however, family members including siblings and offspring may be at an increased risk to be carriers of a Fragile X premutation. Testing children is not indicated outside of associated clinical symptoms but all individuals of childbearing age could benefit from carrier testing and consultation with a genetic counselor.

FMR1 Premutation Carriers

FMR1 intermediate allele carriers (those with 45 to 54 CGG repeats) are NOT at an increased risk to have a child with Fragile X; however, family members including siblings and offspring may be at an increased risk to be carriers of a Fragile X premutation. Testing children is not indicated outside of associated clinical symptoms but all individuals of childbearing age could benefit from carrier testing and consultation with a genetic counselor.

Fragile X-associated Primary Ovarian Insufficiency (POI)

Females who are premutation carriers are at an increased risk of developing POI (early menopause and reduced fertility, previously called POF). Approximately 1% of women in the general population develop Primary Ovarian Insufficiency (POI) while premutation carriers are estimated to have up to a 21% chance of developing POI. It is important to note that 5 to 10% of women with POI are able to conceive after receiving a diagnosis of POI.

Fragile X Tremor Ataxia Syndrome (FXTAS)

Both male and female premutation carriers (those with 55- 200 CGG repeats) are at risk for developing a late onset (over 50) neurological condition called FXTAS. Individuals with FXTAS can develop trouble walking, leading to increased tendency to fall and subsequent dependence on walking aids. On average, male premutation carriers over age 50 have a 40% chance of developing FXTAS. The risk for female premutation carriers to develop FXTAS has not been defined; however, females seem to be at a lower risk of developing FXTAS when compared to males.

How the Genetics Work

FMR1-related disorders are caused by an expansion of a segment of DNA, known as the CGG triplet repeat, within the *FMR1* gene. Generally, this DNA segment is repeated from 5 to about 44 times. There are four classifications of CGG repeats: less than 45 (normal range), between 45 and 54 CGG repeats (intermediate or grey zone), 55 to 200 CGG repeats (premutation), and > 200 CGG repeats (Fragile X).

Questions? Contact us at **1-855-776-9436** to set up an appointment to discuss your results in more detail with a NxGen MDx genetic counselor.