INHERITANCE

IN MALES: Full mutations revert back to premutations during development of X chromosome–carrying sperm. Thus, men with the full mutation or the premutation pass the premutation on to their daughters. Because it is X-linked, they cannot pass it on to their sons.

IN FEMALES: Premutations of 100 CGG repeats or more convert to the full mutation during egg development or in the embryo. Thus, women with the full mutation or a premutation with 100 repeats or more on one of their X chromosomes pass on the full mutation to their children approximately 50 percent of the time. Women with a premutation of fewer than 100 repeats will pass on a full mutation less often.

Wildtype (WT) gene: < 55 CGG repeats
Short premutation: ≤ 100 CGG repeats
Long premutation: > 100 CGG repeats
Full mutation: > 200 CGG repeats

Occasionally, if both parents carry premutations or full mutations, their daughters can inherit two fragile X chromosomes: one with a premutation from the father and the other with either a premutation or a full mutation from the mother.