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## X-INACTIVATION ANALYSIS

**Background:** Evaluating for skewed patterns of X-inactivation can be useful in analysis and diagnosis of X-linked conditions. Skewed patterns of X chromosome inactivation can result in symptomatic female carriers of X-linked recessive conditions, as well as asymptomatic females in X-linked dominant conditions. X-inactivation studies can also be used to determine appropriate testing for relatives of carriers or affected individuals.

**Assay:** DNA samples are digested with and without methylation-sensitive restriction enzyme HpaII. These samples are used as a template for amplification of the region flanking the tri-nucleotide repeat of the androgen receptor gene (ARA) promoter region on the X-chromosome. Methylation of the ARA gene is correlated with X-inactivation.

**Utility:** Diagnostic confirmation

**Sensitivity:** Skewed X inactivation occurring by chance appears to be rare, but has been reported in a series of phenotypically normal females. Skewing to the extent of >80:20 was observed in 8% of cases and to >95:5 in 0.8% of cases. Sensitivity will vary per case due to the potential for markers to be uninformative; uninformative markers occur in ~1% of cases.

**Turn around:** 3-4 weeks

**Fees:** X-inactivation study (individual): \$500  
X-inactivation studies (child and parent(s)): \$720

**CPT codes:** X-inactivation study (individual): 81401  
X-inactivation studies (child and parent(s)): 81401 x 3

**References:** Amos-Landgraf JM, Cottle A, Plenge RM, Friez M, Schwartz CE, Longshore J, Willard HF. X chromosome-inactivation patterns of 1,005 phenotypically unaffected females. *Am J Hum Genet* 2006;79:493–9

Name of Test	Turnaround Time	Cost	CPT codes
X-Inactivation Studies: Individual	3-4 weeks	\$500	81401
X-Inactivation Studies: Individual and Parent(s)	3-4 weeks	\$720	81401x3