Description

Preimplantation Genetic Diagnosis (PGD) and Preimplantation Genetic Screening (PGS) are used to detect genetic conditions, chromosome abnormalities, and fetal sex during assisted reproduction with in vitro fertilization (IVF). PGD refers to embryo testing that is performed when one or both parents have a known genetic abnormality. This includes single-gene mutations and chromosome rearrangements. PGS refers to screening an embryo for aneuploidy when both parents are chromosomally normal. Genetic testing is performed on cells from the developing embryo prior to implantation. Only those embryos not affected with a genetic condition are implanted. PGD may allow at-risk couples to avoid a pregnancy affected with a genetic condition. The Society for Assisted Reproductive Technology and the American Society for Reproductive Medicine have published joint practice committee opinions to address the safety, accuracy, and overall efficacy of PGD and PGS.1,2

- This guideline does not include prenatal or preconception carrier screening. Please refer to Genetic Testing for Carrier Status for that purpose.
- This guideline does not include prenatal genetic testing. Please see Genetic Testing for Prenatal Screening and Diagnostic Testing for genetic testing done during pregnancy.

Criteria

Criteria: General coverage guidance

Preimplantation genetic diagnosis may be considered when ALL of the following conditions are met:

- **Technical and clinical validity**: The test must be accurate, sensitive and specific, based on sufficient, quality scientific evidence to support the claims of the test. In the case of PGD, the mutation(s) or translocation(s) to be tested in the embryo should first be well-characterized in the parent(s) AND the embryonic test results must be demonstrated to be highly accurate.

- **Clinical utility**: Healthcare providers can use the test results to provide significantly better medical care and/or assist patients with reproductive planning.

- **Reasonable use**: The usefulness of the test is not significantly offset by negative factors, such as expense, clinical risk, or social or ethical challenges.

AND THE FOLLOWING APPLY:
The couple is known to be at-risk to have child with a genetic condition because of ANY of the following:

- Both parents are known carriers of a recessive genetic condition and the specific gene mutation has been identified in each parent; OR
- One parent is affected by or known to be a carrier of a dominant condition and the specific gene mutation has been identified; OR
- The female contributing the egg is known to be a carrier of an X-linked condition and the specific gene mutation has been identified; OR
- One or both parents are carriers of a structural chromosome rearrangement (e.g., translocation or inversion); OR
- One or both parents have a known chromosome microdeletion (e.g. 22q11 deletion – DiGeorge syndrome, 7q11.23 deletion – Williams syndrome);

AND

- The genetic condition is associated with potentially severe disability or has a lethal natural history.

Note: This guideline ONLY addresses the genetic testing component of PGS or PGD. Coverage of any procedures, services, or tests related to assisted reproduction is subject to any applicable plan benefit limitations.

Criteria: Special circumstances

Sex determination

- PGD for sex (X and Y chromosome testing) is considered medically necessary only for identification of potentially affected embryos for gender-related conditions.

HLA typing

- PGD for human leukocyte antigen (HLA) typing for transplant donation is not considered medically necessary.

PGD is NOT covered for any of the following indications or those not specified specifically above because they are considered experimental, investigational or unproven:

- Carrier testing of the embryo
- Using blastocyst stage biopsy
- Testing for genetic mutations associated with adult onset/late onset disorders that do not definitively cause disease (e.g., APOE testing for Alzheimer's disease; cancer predisposition)
- Testing of embryos for non-medical traits
**Chromosome abnormality screening**

- PGS for de novo chromosome abnormalities is not considered medically necessary. This includes the following indications:
  - Maternal age alone
  - To improve in vitro success rates
  - For recurrent unexplained miscarriage and/or recurrent implantation failures

**Variants of Unknown Significance (VUS)**

- PGD for variants of unknown significance is not considered medically necessary.

**References**
