Clinical Coverage Guidelines: Preimplantation Genetic Diagnosis

Current Effective Date: 08/01/12
Original Effective Date: 01/01/12
Policy Number: OCA: 3.726

Applicable Plan Products

☐ MassHealth  ☐ Commonwealth Care  ☒ Commercial

This policy is applicable only to the Commercial product and does not apply to the MassHealth product or Commonwealth Care product.

Summary:
The Plan requires prior authorization for preimplantation genetic diagnosis (PGD) and considers this procedure medically necessary in members who are infertile and are undergoing IVF for the evaluation of embryos that have been identified at an increased risk of a genetic disorder when the results will impact clinical decision making and/or clinical outcome.

Description of Item or Service:
Preimplantation Genetic Testing: Preimplantation genetic testing is a technique used to identify genetic defects in embryos created through in vitro fertilization (IVF) before pregnancy. Preimplantation genetic diagnosis (PGD) refers specifically to when one or both genetic parents has a known genetic abnormality or carrier state, with the precise mutations known from prior testing, and testing is performed on an embryo (via single-cell biopsy) to determine if it also carries the pathogenic mutation(s). In contrast, preimplantation genetic screening (PGS) refers to techniques where embryos from presumed chromosomally normal genetic parents are screened for aneuploidy.

Clinical Guideline Statement:
1. The Plan requires prior authorization for PGD and considers PGD medically necessary in members who are infertile and are undergoing IVF for the evaluation of embryos that have been identified at an increased risk of a genetic disorder.
when the results will impact clinical decision making and/or clinical outcome when **ALL** of the following criteria are met:

- The Plan requires documentation of genetic counseling that includes a discussion of alternatives to the procedure such as prenatal diagnosis by ultrasound, chorionic villus sampling or amniocentesis; AND
- Documentation of discussion of other reproductive options including gamete donation, remaining childless, accepting genetic risk without testing, and/or adoption; AND
- The services must be provided in centers where appropriate expertise (genetic counseling, molecular genetics, maternal-fetal medicine, embryology) is available; AND
- Both partners are known carriers of a single gene autosomal recessive disorder; OR
- One partner is a known carrier of a single gene autosomal recessive disorder and the partners have one offspring that has been diagnosed with that recessive disorder; OR
- One partner is a known carrier of a single gene autosomal dominant disorder; OR
- One partner is at risk (50%) of carrying a mutation of a single-gene dominant disorder (by virtue of having an affected parent or sibling) but does not wish to know his/her carrier status (which would be revealed if standard prenatal diagnosis were performed and the fetus revealed to be affected); IVF/PGD allows for unaffected embryos to be selected and implanted without revealing to the parents whether or not any affected embryos were also detected; OR
- One partner is a known carrier of a single X-linked disorder; OR
- For evaluation of an embryo at an identified elevated risk of chromosomal abnormality for the following:
  a) One partner with balanced (reciprocal) or unbalanced (Robertsonian) chromosomal translocation

2. The Plan considers up to two (2) PGD procedures medically necessary in conjunction with IVF for members who meet the above criteria. In addition, members who have previously undergone two (2) cycles of PGD with IVF and who continue to meet the PGD criteria above would be eligible for up to an additional two (2) PGD procedures with IVF when there has been an intervening live birth.
Definitions:

**Chromosomal Translocation**: A chromosome abnormality caused by rearrangement of parts between non-homologous chromosomes. A gene fusion may be created when the translocation joins two otherwise separated genes. There are two (2) main types:

- **Reciprocal** (also known as non-Robertsonian or balanced): An even exchange of material with no genetic information extra or missing.
- **Robertsonian** (also known as unbalanced): An unequal exchange of chromosome material resulting in extra or missing genes.

Applicable Coding:

Applicable coding is listed below, subject to codes being active on the date of service. Because the American Medical Association (AMA), Centers for Medicare & Medicaid Services (CMS), and the U.S. Department of Health and Human Services may update codes more frequently or at different intervals than Plan policy updates, the list of applicable codes may not be all inclusive. These codes are not intended to be used for coverage determinations. See the Plan’s **Clinical Coverage Guidelines: Genetic Testing Guidelines, policy number OCA: 3.726**, for further Plan prior authorization requirements.

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<thead>
<tr>
<th>CPT Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>89290</td>
<td>Biopsy, oocyte polar body or embryo blastomere, microtechnique (for preimplantation genetic diagnosis); less than or equal to 5 embryos</td>
</tr>
<tr>
<td>89291</td>
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Limitations:

1. The Plan considers the following services not medically necessary:
   - For testing of embryos for non-medical gender selection or non-medical traits

2. The Plan considers the following services experimental, investigational or unproven:
   - Carrier testing to determine the embryo’s carrier status
   - Human leukocyte antigen (HLA) typing of an embryo to identify a future suitable stem cell, tissue or organ transplantation donor
   - Preimplantation genetic screening (PGS) (i.e., screening embryos for chromosomal abnormalities in the absence of specific inherited genetic conditions identified in either parent). Aneuploidy screening (AS) in the setting of PGS (also called PGD-AS) for purposes of optimizing IVF outcomes in women with advanced maternal age, history of failed IVF cycles, or recurrent miscarriages, in the absence of inherited genetic abnormalities.
   - PGD using blastocyst stage biopsy
   - PGD for chromosomal microarray or whole-genome sequencing
Clinical Background Information:
Preimplantation genetic testing is a technique used to identify genetic defects in embryos created through in vitro fertilization (IVF) before pregnancy. Preimplantation genetic diagnosis (PGD) refers specifically to when one or both genetic parents has a known genetic abnormality or carrier state, with the precise mutations known from prior testing, and testing is performed on an embryo (via single-cell biopsy) to determine if it also carries the pathogenic mutation(s). In contrast, preimplantation genetic screening (PGS) refers to techniques where embryos from presumed chromosomally normal genetic parents are screened for aneuploidy. Because only unaffected embryos are transferred to the uterus for implantation, preimplantation genetic testing provides an alternative to current in utero diagnostic procedures (i.e., amniocentesis or chorionic villus sampling), which are frequently followed by the difficult decision of pregnancy termination if results are unfavorable.

Before requesting preimplantation genetic diagnosis (PGD), candidates should consult a geneticist or a genetic counselor to evaluate the risk of transferring their genetic abnormality to their offspring. Tests should be performed to confirm the diagnosis of the affected parent, to pinpoint the genetic change(s) leading to the condition in question, and to ensure that the currently available technology can identify that genetic change in a polar body or cleavage state.

During PGD, one or two cells are removed by biopsy from the embryos created by in vitro fertilization (IVF) and tested. This cell biopsy is typically performed on the embryo at the polar body or cleavage stage which occurs three days after fertilization. Once the cell has been extracted, its genetic material can be amplified (typically by polymerase chain reaction) and analyzed. Based on the results of genetic tests, parents and maternal-fetal medicine specialists are able to select or deselect which embryos to implant. The procedure is used to screen out embryos carrying a genetic disease with the intended goal of a healthy pregnancy and offspring free of genetic abnormalities.

In 2008, the American Society for Reproductive Medicine and the Society for Assisted Reproductive Technology updated their Practice Committee opinion on preimplantation genetic testing. Recommendations for PGD and PGS were outlined and included the following:

- Before PGD is performed, genetic counseling must be provided.
- PGD can reduce the risk for conceiving a child with a genetic abnormality carried by one or both parents if that abnormality can be identified with tests performed on a single cell.
- Prenatal diagnostic testing by traditional methods (amniocentesis or CVS) to confirm the results of PGD is encouraged strongly because PGD has technical
limitations that include the possibility of false negatives (due to “allele drop-out” or other technical problems).

PGD is controversial and raises issues of sex selection and genetic engineering. It is currently offered only in centers where there is expertise in genetic counseling, molecular genetics and embryology because it is imperative that patients be aware of the potential diagnostic errors, risks of the IVF procedure, and the unknown (though presumed low) risks of the embryo biopsy procedure to the future fetus.

References:


This guideline provides information on BMC HealthNet Plan claims adjudication processing guidelines. The use of this guideline is not a guarantee of payment and will not determine how a specific claim(s) will be paid. Reimbursement is based on member benefits and eligibility, medical necessity review, where applicable, coordination of benefits, adherence to Plan policies, clinical coding criteria, and the BMC HealthNet Plan agreement with the rendering or dispensing provider. Reimbursement policies may be amended at BMC HealthNet Plan’s discretion. BMC HealthNet Plan will always use the most recent CPT and HCPCS coding guidelines. All Plan policies are developed in accordance with state, federal and accrediting organization guidelines and requirements, including NCQA.
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IMPORTANT NOTE: Not all services are covered for all products or employer groups. This medical policy expresses the Plan's determination of whether certain services or supplies are medically necessary, experimental or investigational or cosmetic. The Plan has reached these conclusions based upon the regulatory status of the technology and a review of clinical studies published in peer-reviewed medical literature. Even though this policy may indicate that a particular service or supply is considered covered or not covered, this conclusion is not based upon the terms of a member’s particular benefit plan. Each benefit plan contains its own specific provisions for coverage and exclusions. Not all services that are determined to be medically necessary will necessarily be covered services under the terms of a member’s benefit plan. Members and their providers need to consult the applicable benefit plan document (e.g., Evidence of Coverage) to determine if there are any exclusions or other benefit limitations applicable to this service or supply. If there is a discrepancy between this medical policy and the benefit plan document, the provisions of the benefit plan document will govern. In addition, this policy and the benefit plan document are subject to applicable state and federal laws that may mandate coverage for certain services and supplies.