



GENETICS: COUNSELING, TESTING, SCREENING*

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Status: Current

**This policy includes the following previously separate policies: 91450 Genetic Counseling, Testing and Screening; 91513 Gene Expression Analysis; 91449 Genetic Testing Pre-implantation*

Summary of Changes

Clarifications:

- Pg. 5, Section II, H, additional language added to clarify the use of prognostic testing. Also, additional testing (#6) added under H. Language also updated to reflect specialty physicians ordering prognostic genetic testing have clinical expertise in the specific clinical areas for which the testing is being done.

Deletions:

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Additions:

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I. DESCRIPTION

- A. Genetic Counseling*** Genetic counseling is the process of helping people understand and adapt to the medical, psychological and familial implications of genetic contributions to disease. This process integrates the following:
1. Interpretation of family and medical histories to assess the chance of disease occurrence or recurrence.
 2. Education about inheritance, testing, management, prevention, resources and research.
 3. Counseling to promote informed choices and adaptations to the risk or condition.
 4. Discussion of the ethical and legal aspects of autonomy, privacy, equity and confidentiality as applied to each individual seeking genetic testing.
 5. Psychosocial aspects should be addressed during the pre-test and post-test counseling session surrounding any genetic testing.

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Genetic counselors are defined by the plan as American Board of Medical Genetics or American Board of Genetic Counseling certified physicians or masters or doctorate level-trained genetic counseling professionals who have received formal training in genetics and genetic counseling from an accredited institution. It is the genetic counselor's or physician specialist's role to provide information to the individual or family regarding the genetic disorder that will allow them to make an informed decision.

- B. Genetic Testing.** A genetic test is the analysis of human DNA, RNA, chromosomes, proteins, or certain metabolites in order to detect alterations related to a heritable or acquired disorder. This can be accomplished by directly examining the DNA or



RNA that makes up a gene (direct testing), looking at markers co-inherited with a disease-causing gene (linkage testing), assaying certain metabolites (biochemical testing), or examining the chromosomes (cytogenetic testing). Clinical genetic tests are those in which specimens are examined and results reported to the provider or patient for the purpose of diagnosis, prevention or treatment in the care of individual patients.

- C. Genetic Screening** refers to examining the genes and/or gene products of phenotypically normal or otherwise people to see if they are carriers of an abnormal gene. Carriers usually do not themselves have symptoms related to the gene mutation. Carrier testing is offered to individuals who have family members with a genetic condition, family members of an identified carrier, and individuals in ethnic or racial groups known to have a higher carrier rate for a particular condition.

II. POLICY/CRITERIA

- A. Coverage for genetic counseling, testing and/or screening is provided to Priority Health members when **all** of the following apply:
1. Appropriate genetic counseling occurs before and after testing*.
 2. Documented informed consent occurs before testing**.
 3. There is documented reasonable expectation based on family history, pedigree analysis, risk factors, and/or symptomatology that a genetically inherited or acquired condition exists and the member displays clinical features, or is at direct risk of inheriting the mutation in question (pre-symptomatic) or comes from the appropriate disease-specific population. A three generation pedigree should accompany the request for testing.
 4. Knowledge of the presence or absence of condition would directly affect medical care of the member.
 - a. The disease is treatable and/or preventable and
 - b. The test results will lead to a marked change in the intensity of surveillance frequency and /or intensity of treatment for that disease.
 5. The testing is FDA / CLIA approved
 6. Testing is ordered by the appropriate provider, see section C below:

*Members must have genetic counseling by a genetic counselor **before** testing can occur for certain conditions (see appendix A below). Counseling can occur at the same visit as the sample(s) for testing are collected with appropriate documentation as defined above.

** Health care practitioners in the State of Michigan must follow state law regarding informed consent for predictive genetic testing. (Michigan State Law. 333.17020 Genetic test; informed consent.



[http://www.legislature.mi.gov/\(S\(bcot2wnj3puzmg550rnzukyf\)\)/mileg.aspx?page=getobject&objectname=mcl-333-17020](http://www.legislature.mi.gov/(S(bcot2wnj3puzmg550rnzukyf))/mileg.aspx?page=getobject&objectname=mcl-333-17020)

B. Family Planning and Infertility services may be limited by the member's specific plan and are subject to applicable copays and or coinsurance. See plan documents for details. Family planning and infertility services of any kind are NOT covered for Medicaid members.

C. Limits/Indications

Eight medically appropriate genetic testing categories appear in Sections E through L; these sections identify providers authorized to order the tests and give examples of indications for testing (prior authorization is only *required* for tests in Section I, J, K and L. Obtaining specimens for tests in sections D#2, F, I, J and L and when indicated in sections G and H *must* be coordinated by a Genetic Counselor's office – see appendix A below for a list of specific conditions for which genetic counseling is required and/or recommended).

D. Prenatal Testing

1. Prenatal screening via maternal serum analysis (first and/or second trimester) with nuchal translucency* measurement may be covered for all pregnant women within the prescribed time frame for each of the maternal serum screening options.
2. Prenatal diagnostic genetic testing (via amniocentesis or chorionic villus sampling) will be covered for pregnant women when the member has received genetic counseling by a genetic counselor, the reason for testing is documented, and the testing is ordered by a Family Practice physician providing OB services or by an Obstetrician. Common indications for prenatal diagnosis include but are not limited to:
 - a. Abnormal fetal ultrasound findings
 - b. Abnormal maternal serum first trimester screening, second trimester triple or quad screen, integrated* or alpha-fetoprotein, elevated MSAFP
 - c. Increased risk based on documented family history or carrier status
3. Prenatal diagnostic genetic testing is **not** a covered benefit for:
 - a. Sex determination unless medically indicated
 - b. Prenatal determination of paternity
 - c. Preconceptual testing of sperm, ova, embryos for use in assisted reproduction (e.g. artificial insemination, IVF)

*Nuchal translucency (NT) measurement will only be covered when combined with first trimester serum screening (“combined testing”) at centers which have appropriate certification to do so by either the Fetal Medicine Foundation (FMF) or the Nuchal Translucency Quality Review Program (NTQR). Nuchal translucency measurement alone is not a covered benefit.



- E. **Genetic Carrier Screening:** Indications for genetic carrier testing for at-risk individuals include but are not limited to:
1. African American, Caribbean, West-Indian, West African, Hispanic Caribbean, Mediterranean, Asian, Middle Eastern and other individuals who may be at risk for hemoglobinopathies including sickle cell anemia, alpha and/or beta thalassemia based on ethnicity.
 2. Ashkenazi disease screen, for individuals of Jewish descent (e.g., Tay Sachs, Canavan's Disease, etc.)
 3. Carrier testing* for cystic fibrosis (CF) is medically necessary for members in *any* of the following groups:
 - a. Couples seeking prenatal care; *or*
 - b. Couples who are planning a pregnancy; *or*
 - c. Reproductive partners of persons who have CF or are carriers of CF; *or*
 - d. Males with a diagnosis of congenital bilateral absence of the vas deferens (CBAVD); *or*
 - e. For persons with a family history of CF or a first degree relative identified as a CF carrier see section F below for coverage rules.

Genetic carrier screening for CF is considered experimental and investigational for all other indications.

*covered testing is for a core panel of 25 mutations that are recommended by the American College of Medical Genetics (ACMG) medically necessary for cystic fibrosis genetic testing. The standard mutation panel is available at: <http://www.ama-assn.org/ama/no-index/about-ama/3021.shtm>. Testing for additional CF mutations through an expanded panel will be covered for certain indications when recommended by a genetic counselor.

- F. **Genetic Carrier Testing:** Testing for carrier status of parents with a known genetic risk or suspected carrier status based on their reproductive and/or family history. This testing should only be ordered following genetic counseling by a genetic counselor.
1. Individuals with a known family history of a recessive genetic condition (i.e. Spinal Muscular Atrophy, Sickle Cell, Cystic Fibrosis).
 2. Family members of infants identified by newborn screening as affected or carriers of a genetic condition.
 3. Parental chromosome analysis following the diagnosis of a child with a chromosome abnormality for which a parent may be carrying a chromosome rearrangement or abnormality.
 4. Chromosome analysis for couples with 2 or more miscarriages.
- G. **Suspected Genetic Conditions/ Diagnostic testing – Pediatrics(<18 years old):** Careful consideration must be given to genetic testing and screening of children to



ensure that use of this technology promotes the best interest of the child. Identification of the genetic condition must provide a clear benefit to the child. Testing must be recommended by a Genetic Counselor except as noted below. Tests to confirm or rule out suspected genetic conditions in symptomatic individuals in which confirming a diagnosis would alter the medical management for the individual. This includes but is not limited to the following examples:

1. Chromosomal analysis in a newborn with features of Down Syndrome.
2. Fragile X in a child with mental retardation and /or autism
3. Spinal Muscular Atrophy in a child with neuromuscular problems
4. Sickle Cell Disease
5. Priority Health will cover chromosomal analysis and / or molecular testing to confirm suspected genetic conditions only when ordered by Family Practice, Internal Medicine, Neurology, Obstetric/Gynecology, or Pediatric physicians and in the presence of any of the following:
 - a. Congenital malformation(s)
 - b. Conditions with a known or suspected chromosomal, single gene, mitochondrial, or multifactorial etiology
 - c. Unexplained failure to thrive
 - d. Unexplained developmental delay or loss of developmental milestones
 - e. Unusual growth pattern
 - f. In-utero death of the fetus in the second or third trimester

H. Prognostic Testing: Prognostic testing may be done when the clinical presentation is suggestive of a specific condition and the results will help to determine additional testing or treatment modalities related to existing nonhereditary conditions including, but not limited to the following:

1. Chromosomal analysis for leukemia
2. Flow cytometry for lymphoma
3. Her2Neu for breast cancer
4. HLA Haplotype Analysis for transplant procedures
5. P53 Tumor Marker
6. HLA genotyping for Celiac associated DQ alleles when serologic testing and or intestinal biopsy results are inconsistent with one another or clinical presentation.

Priority Health will cover prognostic genetic testing only when recommended by Genetic Counselors **or** ordered by specialty physicians with expertise in the specific clinical area for which the testing is being done.

I. Predictive Genetic Testing: Predictive testing is offered to asymptomatic individuals with a family history of a genetic disorder. Predictive testing is of two types:

- **presymptomatic** (eventual development of symptoms is certain when the gene mutation is present, e.g., Huntington disease) and
- **predispositional** (eventual development of symptoms is likely but not certain when the gene mutation is present, e.g., breast cancer).



Predictive testing is **MEDICALLY INDICATED** only if early diagnosis allows interventions which reduce morbidity or mortality. Predictive testing for the presence of presymptomatic or predisposition genetic changes in an at-risk individual may be done for conditions such as:

1. BRCA1/BRCA2
2. Hereditary nonpolyposis colorectal cancer (HNPCC)
3. Huntington's Chorea
4. Multiple Endocrine Neoplasia
5. Myotonic Dystrophy
6. Family history of genetic disorders (for example, a previous child with Duchenne's Muscular Dystrophy)
7. Priority Health will cover hereditary predisposition/pre-symptomatic genetic testing only when recommended by a Genetic Counselor.
8. **All** genetic testing in this Section **requires** prior authorization by Priority Health, and must include documentation:
 - a. Of medical necessity
 - b. That genetic counseling has been accomplished
 - c. That informed consent has been obtained
 - d. Results of familial mutation / test results are available upon request

J. Preimplantation Genetic Diagnosis (PGD): Preimplantation genetic diagnosis (PGD), including the oocyte polar body or cleavage stage embryo biopsy procedure, associated genetic testing, and pre- and post-test genetic counseling associated with PGD, is considered medically necessary when the results of the genetic test will impact clinical decision making and/or clinical outcome. PGD in the following situations is intended to be used as an alternative to prenatal genetic diagnosis using amniocentesis or chorionic villus sampling (CVS) and only when a reliable genetic test exists for the disorder and is well established:

1. For the detection of single gene disorders* for the following situations:
 - a. Both partners are known carriers of a single autosomal recessive gene
 - b. One partner is a known carrier of a single gene autosomal dominant disorder
 - c. One partner is a known carrier of a single X-linked disorder

*The disorders resulting from the above genetic disorders (a-c) are potentially lethal or disabling and have limited treatment options and include but are not limited to the following: Tay Sachs, spinal muscular atrophy, myotonic dystrophy, Huntington's disease, and X-linked disorders including Duchenne's muscular dystrophy and Fragile-X syndrome. All disorders for which testing is requested should have significant probability for recurrence, i.e. 25% or more likelihood for recurrence.

2. Couples in whom one or more partners has a known chromosomal abnormality such as a balanced translocation.



3. PGD is NOT covered for any of the following indications or those not specified specifically above because they are considered experimental, investigational or unproven:
 - a. Screening of common aneuploidy in women of advanced maternal age (i.e., age 35 or older), with repeat IVF failures or recurrent spontaneous abortions, or for the purpose of improving IVF implantation success
 - b. Detection of chromosomal translocations in women of advanced maternal age, with repeat IVF failures or recurrent spontaneous abortions, or for the purpose of improving IVF implantation success
 - c. For the purpose of human leukocyte antigen (HLA) typing of an embryo to identify a future suitable stem cell, tissue or organ transplantation donor
 - d. For the purposes of carrier testing to determine carrier status of the embryo (determination of carrier status is performed on individuals contemplating reproduction)
 - e. Using blastocyst stage biopsy
 - f. For adult-onset/late-onset disorders (e.g., Alzheimer's disease; cancer predisposition)
 - g. Testing of embryos for non-medical gender selection or non-medical traits
 4. All other services associated with PGD are subject to the member's specific policy and associated certificate of coverage (COC). This includes, but is not limited to, all services and supplies relating to artificial insemination, in-vitro fertilization, embryo or ovum transfer procedures, any other assisted reproduction procedure, prescription drugs designed to achieve pregnancy, and ultrasounds for egg harvest. Please refer to the appropriate COC for further information.
 5. For Medicaid and MICHild – IVF, artificial insemination and other forms of infertility treatment are not a covered benefit, therefore genetic counseling/testing/screening done in conjunction with these services would not be covered.
- K. **Gene Expression Analysis:** see specific areas of application below. Prior authorization is required for any covered applications.
1. **Breast Cancer Treatment Assessment**
Several panels of gene expression markers have been developed for the purpose of predicting the likelihood of breast cancer recurrence in various populations of women with node-negative disease. These panels may be useful for identifying women who are unlikely to experience recurrence and, thus, unlikely to benefit from adjuvant chemotherapy. Such panels are designed to identify women who can safely avoid adjuvant chemotherapy, without negatively affecting disease-free and overall survival outcomes.



Currently there are several panels available for use in determining treatment strategy. However, based upon published reports of reproducibility outside of the initial study, only Oncotype DX™ (21-gene panel; Genomic Health) is available as a covered benefit at this time. Oncotype DX™ measures the levels of expression of 21 genes (whether they are transcribed into messenger RNA) in breast tumors. This assessment is intended to help guide a person's risk of recurrence more precisely than standard characteristics, such as tumor size and grade alone. Based on the Oncotype DX™ gene expression analysis, a recurrence score from 0 to 100 is generated; the higher the score, the greater a woman's chance of having a recurrence if treated with hormonal therapy alone. Based on their recurrence score, women are assigned to three different treatment groups:

- a. Women with a recurrence score higher than 25 generally receive chemotherapy plus hormonal therapy (the standard of care)
 - b. Women with a recurrence score lower than 11 generally will receive hormonal therapy alone
 - c. Women with a recurrence score of 11 to 25 are encouraged to consider participating in the TAILORx trial (see Note below). Locations for enrollment and participation are available through <http://clinicaltrials.gov>
- A. Oncotype DX™ (21-gene panel; Genomic Health) is considered medically appropriate to assess the need for adjuvant chemotherapy in women with recently diagnosed breast cancer when **all** of the following criteria 1-6 are met (see prior authorization form for gene expression analysis):
1. Breast tumor is stage 1 or stage 2.
 2. Breast tumor is estrogen-receptor positive.
 3. Breast tumor is HER2-receptor negative, or breast tumor is HER2 receptor positive and less than 1 cm in diameter.
 4. There is no evidence of metastatic breast cancer, and the patient is axillary-node negative (nodes with micrometastases less than 2 mm in size are considered node negative).
 5. The patient is a candidate for possible adjuvant chemotherapy (i.e., chemotherapy is not precluded due to other factors).
 6. Member and physician (prior to testing) have discussed the potential results of the test and agree to use the results to guide therapy (i.e., member will forgo adjuvant chemotherapy if Oncotype Dx score is low).
- B. For patients choosing chemotherapy for an intermediate risk score, the clinical rationale must be provided for treatment since chemotherapy is still of unproven benefit.

**Note:**

Unfortunately treatment algorithms do not exist for women with a recurrence score of 11 to 25. The TAILORx trial is designed primarily to evaluate the effect of chemotherapy on those with a recurrence score of 11 to 25. Women participating in this trial who are in this group will be randomly assigned to receive adjuvant hormonal therapy, with or without chemotherapy. The TAILORx seeks to determine if the Oncotype DX™ test will be helpful in future treatment planning for this group.

- C. Oncotype Dx is not covered for any other clinical evaluation.
- D. Other assays of genetic expression in tumor tissue (e.g., MammaPrint®, Rotterdam Signature 76-Panel) are not covered because they are considered experimental, investigational or unproven.

2. Fecal DNA Screening for Colorectal Cancer

Fecal DNA testing is performed on stool samples that are submitted to a laboratory after being collected by patients at home. The test is designed as a screening option for patients who are unwilling or unable to undergo a colonoscopy. The test detects colorectal cancer based on the presence of specific, cancer-associated mutations in DNA that is extracted from the stool sample. These specific DNA mutations in the stool arise from tumors within the colon. This DNA is continuously shed from the tumor into the stool. Patients with a positive fecal DNA test result must then undergo a definitive test for colon cancer, such as a colonoscopy. Fecal DNA screening is considered to be experimental and investigational and is not a covered benefit.

3. Cytochromes P450 (CYP450)

The AmpliChip CYP450 test was developed as a clinical test to evaluate an individual's metabolic capacity for certain drugs by identifying polymorphisms of 2 CYP450 enzymes (ie, CYP2D6 and CYP2D19). Pharmacogenetic factors operate at pharmacokinetic as well as pharmacodynamic levels- the two components of the dose-response curve of a drug. Polymorphisms in drug metabolizing enzymes, transporters and/or pharmacological targets of drugs may profoundly influence the dose-response relationship between individuals. For some drugs, although retrospective data from case studies suggests that these polymorphisms are frequently associated with adverse drug reactions or failure of efficacy, the clinical utility of such data remains unproven. CYP450 is considered to be experimental and investigational and is not a covered benefit.

L. Testing of member and non-member relatives:

- 1. Genetic testing is *not* a covered benefit if the test results do not provide direct medical benefit to the member unless it provides direct medical benefit to other relatives that are also Priority Health members and this benefit is documented.



2. Genetic testing of a non-member relative of a member *may* be a covered benefit if *all* of the criteria in a through e are met:
 - a. The test results are for the direct medical benefit of the member and testing the nonplan relative is the most cost effective method to obtain the medically necessary information for the member.
 - b. The nonplan relative's insurance company has been billed and payment has been denied.
 - c. Coverage is limited to the testing of *five* nonplan relatives as a lifetime benefit for a member.
 - d. Testing of the non-member relative has been recommended by a genetics counselor *and* approved by Priority Health.
 - e. All genetic testing must be processed through a Priority Health provider phlebotomist and laboratory, unless otherwise specified by the Genetics Counselor.

3. In the absence of specific information regarding advances in the knowledge of mutation characteristics for a particular disorder, the current literature indicates that genetic tests for inherited disease need only be conducted once per lifetime of the member.

M. Exclusions

1. The following are examples of services that are not covered:
 - a. Routine, ongoing, or long term genetic counseling.
 - b. Genetic testing to determine the paternity of a child.
 - c. Genetic testing to determine the sex of the child.
 - d. General population screening for genetic disorders (e.g., cystic fibrosis).
 - e. ApoE for hyperlipidemia and/or Alzheimer's Disease

Special Notes: Informed *consent* is *required* for all genetic tests in accordance with Michigan law PUBLIC HEALTH CODE (EXCERPT) Act 368 of 1978: 333.17020 Genetic test; informed consent Sec. 17020

Informed consent indicates the ordering clinician has discussed:

The potential benefits, harms and limitations of the test to be ordered and the implications of positive, negative or ambiguous results.

Members should have access to genetic counseling before genetic testing.

A referral to genetics counseling should be made when a positive, abnormal or equivocal genetics test result is obtained.

Priority Health Medical Policy developed in cooperation with Spectrum Health Department of Genetics: Helga Toriello, PhD, FACMG; Cindy R. Bos, MD, PhD; Debra Duquette, MS; Karen Lewis, MS.



III. MEDICAL NECESSITY REVIEW

- Required as defined in above sections. All tests performed at non-participating laboratories will require prior authorization.

This policy reflects the recommendation of the Technology Assessment Committee review on March 3, 2006 and June 9, 2006.

IV. APPLICATION TO PRODUCTS:

Coverage is subject to member’s specific benefits. Group specific policy will supersede this policy when applicable.

- ❖ **HMO/EPO:** *This policy applies to insured HMO/EPO plans.*
- ❖ **POS:** *This policy applies to insured POS plans.*
- ❖ **PPO:** *This policy applies to insured PPO plans.*
- ❖ **ASO:** *For self-funded plans, consult individual plan documents. If there is a conflict between this policy and a self-funded plan document, the provisions of the plan document will govern.*
- ❖ **INDIVIDUAL:** *For individual policies, consult the individual insurance policy. If there is a conflict between this medical policy and the individual insurance policy document, the provisions of the individual insurance policy will govern.*
- ❖ **MEDICARE:** *Coverage is determined by the Centers for Medicare and Medicaid Services (CMS).*
- ❖ **MEDICAID:** *Coverage is determined by the Michigan Medicaid Provider Manual and the Michigan Medicaid Fee Schedule at: http://www.michigan.gov/mdch/0,1607,7-132-2945_42542_42543_42546_42551-159815--00.html.*
- ❖ **MICHILD:** *For MICHILD members, this policy will apply unless MICHILD certificate of coverage limits or extends coverage.*

V. CODING INFORMATION

ICD-9 Codes that may support medical necessity

See criteria

CPT/HCPCS Codes

Genetic Testing - Molecular Diagnostics

83890	Molecular diagnostics; molecular isolation or extraction
83891	Molecular diagnostics; isolation or extraction of highly purified nucleic acid
83892	Molecular diagnostics; enzymatic digestion
83893	Molecular diagnostics; dot/slot blot production
83894	Molecular diagnostics; separation by gel electrophoresis (eg, agarose, polyacrylamide)
83896	Molecular diagnostics; nucleic acid probe, each
83897	Molecular diagnostics; nucleic acid transfer (eg, Southern, Northern)
83898	Molecular diagnostics; amplification of patient nucleic acid, each nucleic acid sequence
83900	Molecular diagnostics; amplification of patient nucleic acid, multiplex, first two nucleic acid sequences



- 83901 Molecular diagnostics; amplification of patient nucleic acid, multiplex, each additional nucleic acid sequence (List separately in addition to code for primary procedure)
- 83902 Molecular diagnostics; reverse transcription
- 83903 Molecular diagnostics; mutation scanning, by physical properties (eg, single strand conformational polymorphisms (SSCP), heteroduplex, denaturing gradient gel electrophoresis (DGGE), RNA'ase A), single segment, each
- 83904 Molecular diagnostics; mutation identification by sequencing, single segment, each segment
- 83905 Molecular diagnostics; mutation identification by allele specific transcription, single segment, each segment
- 83906 Molecular diagnostics; mutation identification by allele specific translation, single segment, each segment
- 83907 Molecular diagnostics; lysis of cells prior to nucleic acid extraction (eg, stool specimens, paraffin embedded tissue)
- 83908 Molecular diagnostics; signal amplification of patient nucleic acid, each nucleic acid sequence
- 83909 Molecular diagnostics; separation and identification by high resolution technique (eg, capillary electrophoresis)
- 83912 Molecular diagnostics; interpretation and report
- 83913 Molecular diagnostics; RNA stabilization
- 83914 Mutation identification by enzymatic ligation or primer extension, single segment, each segment (eg, oligonucleotide ligation assay (OLA), single base chain extension (SBCE), or allele-specific primer extension (ASPE))
- 84999 Unlisted chemistry procedure

Genetic Testing - Cytogenetics

- 88230 Tissue culture for non-neoplastic disorders; lymphocyte
- 88233 Tissue culture for non-neoplastic disorders; skin or other solid tissue biopsy
- 88235 Tissue culture for non-neoplastic disorders; amniotic fluid or chorionic villus cells
- 88237 Tissue culture for neoplastic disorders; bone marrow, blood cells
- 88239 Tissue culture for neoplastic disorders; solid tumor
- 88240 Cryopreservation, freezing and storage of cells, each cell line
- 88241 Thawing and expansion of frozen cells, each aliquot
- 88245 Chromosome analysis for breakage syndromes; baseline Sister Chromatid Exchange (SCE), 20-25 cells
- 88248 Chromosome analysis for breakage syndromes; baseline breakage, score 50-100 cells, count 20 cells, 2 karyotypes (eg, for ataxia telangiectasia, Fanconi anemia, fragile X)
- 88249 Chromosome analysis for breakage syndromes; score 100 cells, clastogen stress (eg, diepoxybutane, mitomycin C, ionizing radiation, UV radiation)
- 88261 Chromosome analysis; count 5 cells, 1 karyotype, with banding
- 88262 Chromosome analysis; count 15-20 cells, 2 karyotypes, with banding
- 88263 Chromosome analysis; count 45 cells for mosaicism, 2 karyotypes, with banding
- 88264 Chromosome analysis; analyze 20-25 cells
- 88267 Chromosome analysis, amniotic fluid or chorionic villus, count 15 cells, 1 karyotype, with banding
- 88269 Chromosome analysis, in situ for amniotic fluid cells, count cells from 6-12 colonies, 1 karyotype, with banding
- 88271 Molecular cytogenetics; DNA probe, each (eg, FISH)



- 88272 Molecular cytogenetics; chromosomal in situ hybridization, analyze 3-5 cells (eg, for derivatives and markers)
- 88273 Molecular cytogenetics; chromosomal in situ hybridization, analyze 10-30 cells (eg, for microdeletions)
- 88274 Molecular cytogenetics; interphase in situ hybridization, analyze 25-99 cells
- 88275 Molecular cytogenetics; interphase in situ hybridization, analyze 100-300 cells
- 88280 Chromosome analysis; additional karyotypes, each study
- 88283 Chromosome analysis; additional specialized banding technique (eg, NOR, C-banding)
- 88285 Chromosome analysis; additional cells counted, each study
- 88289 Chromosome analysis; additional high resolution study
- 88291 Cytogenetics and molecular cytogenetics, interpretation and report
- 88299 Unlisted cytogenetic study
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- 88384 Array-based evaluation of multiple molecular probes; 11 through 50 probes
- 88385 Array-based evaluation of multiple molecular probes; 51 through 250 probes
- 88386 Array-based evaluation of multiple molecular probes; 251 through 500 probes
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- 89290 Biopsy, oocyte polar body or embryo blastomere, microtechnique (for pre-implantation genetic diagnosis); less than or equal to 5 embryos
- 89291 Biopsy, oocyte polar body or embryo blastomere, microtechnique (for pre-implantation genetic diagnosis); greater than 5 embryos

Genetic Screening ("S" codes not payable for Medicare or Medicaid)

- S3713 Kras mutation analysis testing
- S3800 Genetic testing for amyotrophic lateral sclerosis (ALS)
- S3818 Complete gene sequence analysis; BRCA 1 gene
- S3819 Complete gene sequence analysis; BRCA 2 gene
- S3820 Complete BRCA1 and BRCA2 gene sequence analysis for susceptibility to breast and ovarian cancer
- S3822 Single mutation analysis (in individual with a known BRCA1 or BRCA2 mutation in the family) for susceptibility to breast and ovarian cancer
- S3823 Three-mutation BRCA1 and BRCA2 analysis for susceptibility to breast and ovarian cancer in Ashkenazi individuals
- S3828 Complete gene sequence analysis; MLH1 gene
- S3829 Complete gene sequence analysis; MLH2 gene
- S3830 Complete MLH1 and MLH2 gene sequence analysis for hereditary nonpolyposis colorectal cancer (HNPCC) genetic testing
- S3831 Single-mutation analysis (in individual with a known MLH1 and MLH2 mutation in the family) for hereditary nonpolyposis colorectal cancer (HNPCC) genetic testing
- S3833 Complete APC gene sequence analysis for susceptibility to familial adenomatous polyposis (FAP) and attenuated fap
- S3834 Single-mutation analysis (in individual with a known APC mutation in the family) for susceptibility to familial adenomatous polyposis (FAP) and attenuated FAP
- S3835 Complete gene sequence analysis for cystic fibrosis genetic testing
- S3837 Complete gene sequence analysis for hemochromatosis genetic testing
- S3840 DNA analysis for germline mutations of the RET proto-oncogene for susceptibility to multiple endocrine neoplasia type 2
- S3841 Genetic testing for retinoblastoma
- S3842 Genetic testing for Von Hippel-Lindau disease



- S3843 DNA analysis of the F5 gene for susceptibility to factor V Leiden thrombophilia
S3844 DNA analysis of the connexin 26 gene (GJB2) for susceptibility to congenital, profound deafness
S3845 Genetic testing for alpha-thalassemia
S3846 Genetic testing for hemoglobin E beta-thalassemia
S3847 Genetic testing for Tay-Sachs disease
S3848 Genetic testing for Gaucher disease
S3849 Genetic testing for Niemann-Pick disease
S3850 Genetic testing for sickle cell anemia
S3851 Genetic testing for Canavan disease
S3853 Genetic testing for myotonic muscular dystrophy
S3860 Genetic testing, comprehensive cardiac ion channel analysis, for variants in 5 major cardiac ion channel genes for individuals with high index of suspicion for familial long QT syndrome (LQTS) or related syndromes
S3861 Genetic testing, sodium channel, voltage-gated, type V, alpha subunit (SCN5A) and variants for suspected Brugada Syndrome
S3862 Genetic testing, family-specific ion channel analysis, for blood-relatives of individuals (index case) who have previously tested positive for a genetic variant of a cardiac ion channel syndrome using either one of the above test configurations or confirmed results from another laboratory
S3865 Comprehensive gene sequence analysis for hypertrophic cardiomyopathy
S3866 Genetic analysis for a specific gene mutation for hypertrophic cardiomyopathy (HCM) in an individual with a known HCM mutation in the family
S3870 Comparative genomic hybridization (CGH) microarray testing for developmental delay, autism spectrum disorder and/or mental retardation
88299 Unlisted Cytogenic Study (*Explanatory notes must accompany claim*)
84999 Unlisted chemistry procedure (*Explanatory notes must accompany claim*)

Gene Expression Analysis (Oncotype Dx only) (“S” codes not payable for Medicare or Medicaid)

- S3854 Gene expression profiling panel for use in the management of breast cancer treatment
84999 Unlisted chemistry procedure (*Explanatory notes must accompany claim*)

Genetic Counseling (“S” codes not payable for Medicare or Medicaid)

- 96040 Medical genetics and genetic counseling services, each 30 minutes face-to-face with patient/family
S0265 Genetic counseling, under physician supervision, each 15 minutes

Not Covered

- S3852 DNA analysis for APOE epsilon 4 allele for susceptibility to Alzheimer's disease
S3855 Genetic testing for detection of mutations in the presenilin, 1 gene
S3890 DNA analysis, fecal, for colorectal cancer screening



VI. REFERENCES

1. *Genetic Testing Medical Policy*, Dean Health Plan, Madison, WI. April 2001
2. *Genetic Counseling/Genetic Testing/ Genetic Screening Medical Policy*, Care Choices, Farmington Hills, MI. December 2000.
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APPENDIX A

Conditions for which Genetic Counseling* is required or recommended prior to genetic testing:

Genetic Counseling Required	Genetic Counseling Recommended
Hereditary Cancer Syndromes: including but not limited to BRCA, HNPCC, FAP, MYH, Cowden Syndrome, Li Fraumeni syndrome, Peutz-Jeghers syndrome, Ataxia Telangiectasia	Prenatal screening: serum screening, sequential screening, etc.
Pre-symptomatic testing: familial conditions including but not limited to Huntington’s Chorea, alzheimer’s disease	Carrier screening: Individuals from ethnic groups recognized to be at increased risk for specific genetic disorders (e.g., African Americans for sickle cell anemia, Ashkenazi Jewish (eastern European) for Tay-Sachs disease)
Pre-implantation diagnosis: Pre-test discussion on conditions to be tested for.	Diagnostic testing: Tests to confirm or rule out suspected genetic conditions in symptomatic individuals in which confirming a diagnosis has the potential to alter the medical management for the individual, i.e., muscular dystrophy, spinal muscular atrophy, microdeletion syndromes.
Prenatal diagnosis: chorionic villus sampling (CVS), amniocentesis	Conditions identified by newborn screening
Carrier testing: testing for carrier status when there is a known or suspected genetic condition in the family (i.e., cystic fibrosis carrier testing, Fragile X pre-mutation carrier testing, etc.)	
Pre and post Testing of at-risk family members for cardiac conditions in which the proband (individual with specific genetic condition has been identified) has an identifiable mutation i.e., Long QT syndrome, hypertrophic cardiomyopathy. Post test counseling for clinically symptomatic individuals.	