GUIDELINES
This policy does not certify benefits or authorization of benefits, which is designated by each individual policyholder contract. Paramount applies coding edits to all medical claims through coding logic software to evaluate the accuracy and adherence to accepted national standards. This guideline is solely for explaining correct procedure reporting and does not imply coverage and reimbursement.

DESCRIPTION
Comparative genomic hybridization (CGH), also referred to as chromosomal microarray analysis (CMA), and array CGH (aCGH), is a method of genetic testing that may detect aneuploidy, triploidy, as well as deletions and duplications. CMA has the ability to detect smaller deletions and duplications within chromosomes than what traditional karyotypes are able to detect. It is being utilized for the screening, diagnosis and treatment of congenital anomalies, autism spectrum disorder (ASD), developmental delays (DD), idiopathic intellectual disability in newborns or children, and screening for prenatal chromosomal abnormalities.

For individuals who require CGH/CMA testing in which the results are negative, some clinicians consider multi-gene panels that analyze several genes relevant to a specific condition utilizing next-generation sequencing. Next-generation sequencing (NGS) involves the sequencing of millions of fragments of genetic material in a massively parallel fashion. NGS can be performed on segments of genetic material of a variety of sizes from the entire genome (whole-genome sequencing) to small subsets of genes (targeted sequencing). NGS allows the detection of SNPs, CNVs, and insertions and deletions. With higher resolution comes higher likelihood of detection of variants of uncertain clinical significance. For information regarding coverage of Multi-Gene Panel Testing, please refer to Medical Policy PG0451.

POLICY
CGH (81228, 81229, S3870) requires prior authorization for HMO, PPO, Individual Marketplace, Advantage
Code S3870 is non-covered for Advantage.

CGH (81228, 81229, S3870) is non-covered for Elite.

HMO, PPO, Individual Marketplace, Advantage
Comparative genomic hybridization may be considered medically necessary for diagnosing chromosomal abnormalities as a first-line test in the initial evaluation of individuals with the following indications:
• An individual with multiple anomalies not associated with a specific genetic syndrome
• An individual with non-syndromic developmental delay/intellectual disability
• An individual with autism spectrum disorder.

WHEN the individual and/or their parents/guardians have engaged in face-to-face genetic counseling with a healthcare professional who has appropriate genetics training and experience.

Comparative genomic hybridization, as an alternative to fetal karyotyping, may be considered medically necessary for the evaluation of a fetus for ANY of the following:
• Abnormal fetal anatomic findings which are characteristic of a genetic abnormality
• Fetal demise with congenital anomalies
• In individuals with a structurally normal fetus undergoing invasive prenatal diagnostic testing
• The individual is considered at high risk for fetal aneuploidy due to ANY of the following:
  o The expectant mother will be 35 years of age or older at the time of delivery
  o The expectant mother has a history of a prior pregnancy with a fetal aneuploidy
  o The expectant mother has a positive first or second-trimester standard biomarker screening test

WHEN the mother/couple have engaged in face-to-face genetic counseling with a healthcare professional who has appropriate genetics training and experience.
Comparative genomic hybridization to confirm the diagnosis of a disorder or syndrome that is routinely diagnosed based on clinical evaluation alone is **not medically necessary**.

Customized CGH using custom-designed, proprietary probes to detect novel genetic variants that may be associated with autism spectrum disorder (ASD), alone (eg, FirstStepDX PLUS [Lineagen]) or with reflex next-generation sequencing (NGS) (eg, NextStepDX PLUS [Lineagen]) is considered **investigational**.

For information regarding multi-gene panels, please see medical policy PG0451 Germline Multi-Gene Panel Testing.

**Elite**
Comparative genomic hybridization (81228, 81229, S3870) is non-covered.

**CODING/BILLING INFORMATION**
The appearance of a code in this section does not necessarily indicate coverage. Codes that are covered may have selection criteria that must be met. Payment for supplies may be included in payment for other services rendered.

<table>
<thead>
<tr>
<th>HPCPCS CODE</th>
<th>Description</th>
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<tbody>
<tr>
<td>S3870</td>
<td>Comparative genomic hybridization (CGH) microarray testing for developmental delay, autism spectrum disorder and/or mental retardation</td>
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<table>
<thead>
<tr>
<th>CPT CODE</th>
<th>Description</th>
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<tbody>
<tr>
<td>81228</td>
<td>Cytogenomic constitutional (genome-wide) microarray analysis; interrogation of genomic regions for copy number variants (eg, bacterial artificial chromosome [BAC] or oligo-based comparative genomic hybridization [CGH] microarray analysis)</td>
</tr>
<tr>
<td>81229</td>
<td>Cytogenomic constitutional (genome-wide) microarray analysis; interrogation of genomic regions for copy number and single nucleotide polymorphism (SNP) variants for chromosomal abnormalities</td>
</tr>
</tbody>
</table>

**TAWG REVIEW DATES:** 05/09/2012, 05/15/2013, 07/18/2014, 05/21/2015, 03/25/2016, 12/16/2016, 01/27/2017, 12/15/2017, 09/27/2018

**REVISION HISTORY EXPLANATION**
07/18/14: Policy created per The Technology Assessment Working Group (TAWG) to reflect the most current clinical evidence.
05/21/15: CGH (81228, 81229, S3870) will now be covered for all product lines with prior authorization except procedure code S3870 is non-covered for Advantage per ODM appendix DD. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
03/25/16: Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
12/16/16: CGH may now be covered for prenatal testing with prior authorization. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
01/27/17: Customized CGH using custom-designed, proprietary probes to detect novel genetic variants that may be associated with ASD, alone (eg, FirstStepDX PLUS) or with reflex NGS (eg, NextStepDX PLUS) is considered investigational. Panel testing using NGS is considered investigational in all cases of suspected genetic abnormality in children with developmental delay/intellectual disability, autism spectrum disorder, or congenital anomalies. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
12/15/17: Code S3870 is Non-Medicare and therefore non-covered for Elite. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
09/27/18: Comparative genomic hybridization (81228, 81229, S3870) is non-covered per CMS guidelines. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).
7/9/2019: Policy reviewed and updated to reflect most current clinical evidence per the American College of Medical Genetics, American College of Obstetricians & Gynecologist, and Society for Maternal Fetal Medicine. Deleted information regarding multi-gene panels, as there is a medical policy now (PG0451).

**REFERENCES/RESOURCES**
Centers for Medicare and Medicaid Services, CMS Manual System and other CMS publications and services
Ohio Department of Medicaid [http://jfs.ohio.gov/](http://jfs.ohio.gov/)
Centers for Medicare and Medicaid Services, Healthcare Common Procedure Coding System, HCPCS Release and Code Sets
American College of Medical Genetics (ACMG) Practice Guidelines, Array-Based Technology and Recommendation for Utilization in Medical Genetics Practice for Detection of Chromosomal Abnormalities, 2010

The American Society of Human Genetics (ASHG), Consensus Statement: Chromosomal Microarray is a First-Tier Clinical Diagnostic Test for Individuals with Developmental Disabilities or Congenital Anomalies, 2010