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 identify small deletions and duplications of the subtelomers, each pericentromeric region and other chromosome regions. It is being investigated for the screening, diagnosis and treatment of congenital anomalies, autism spectrum disorder (ASD), developmental delays (DD), idiopathic mental retardation (MR) in newborns or children, and screening for prenatal gene mutations.

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.

Definitions, from the American College of Medical Genetics Guideline, Evaluation of the Newborn with Single or Multiple Congenital Anomalies:
- A malformation refers to abnormal structural development.
- A major malformation is a structural defect that has a significant effect on function or social acceptability. Examples: ventricular septal defect or a cleft lip.
- A minor malformation is a structural abnormality that has minimal effect on function or societal acceptance. Examples: preauricular ear pit or partial syndactyly (fusion) of the second and third toes.
- A syndrome is a recognizable pattern of multiple malformations. Syndrome diagnoses are often relatively straightforward and common enough to be clinically recognized without specialized testing. Examples include Down syndrome, neural tube defects and achondroplasia. However, in the very young, or in the case of syndromes with variable presentation, confident identification may be difficult without additional testing.

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 a genetic abnormality in children with apparent nonsyndromic cognitive developmental delay/intellectual disability (DD/ID) or autism spectrum disorder (ASD) according to accepted Diagnostic and Statistical Manual of Mental Disorders-V criteria when ALL of the following conditions are met:
- Any indicated biochemical tests for metabolic disease have been performed, and results are non-diagnostic
- FMR1 gene analysis (for Fragile X), when clinically indicated, is negative
- In addition to a diagnosis of nonsyndromic DD/ID or ASD, the child has one or more of the following:
  - Two or more major malformations
  - A single major malformation or multiple minor malformations, in an infant or child who is also small-for-dates
  - A single major malformation and multiple minor malformations
- The results for the genetic testing have the potential to impact the clinical management of the patient
- Testing is requested after the parent(s) have been engaged in face-to-face genetic counseling with a healthcare professional who has appropriate genetics training and experience
Comparative genomic hybridization is considered **investigational** in all other cases of suspected genetic abnormality in children with developmental delay/intellectual disability or autism spectrum disorder.

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**.

Panel testing using next-generation sequencing (NGS) is considered **investigational** in all cases of suspected genetic abnormality in children with developmental delay/intellectual disability, autism spectrum disorder, or congenital anomalies (this list may not be all-inclusive):

- Syndromic Autism Panel (Greenwood Genetic Center)
- Autism NGS Panel (Fulgent Diagnostics)
- Autism & Intellectual Disability NGS Panel (Transgenomic Inc.)
- Intellectual Disability NGS Panel (Fulgent)
- devSEEK Sequence Analysis for Neurodevelopmental Disorders (Courtagen)
- devACT Clinical Management Panel (Courtagen)
- X-Linked Intellectual Disability NGS Panel (Emory)

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:
  - The expectant mother will be 35 years of age or older at the time of delivery
  - The expectant mother has a history of a prior pregnancy with a trisomy
  - The expectant mother has a positive first or second-trimester standard biomarker screening test

**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.

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<thead>
<tr>
<th>HCPCS CODE</th>
<th>Description</th>
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<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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**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 for Elite per CMS guidelines. Policy reviewed and updated to reflect the most current clinical evidence per The Technology Assessment Working Group (TAWG).

**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 Guideline
Industry Standard Review
Hayes, Inc.