carelon

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Approval and implementation dates for specific health plans may vary. Please consult the applicable health plan for more details.

Clinical Appropriateness Guidelines

Genetic Testing

Appropriate Use Criteria: Whole Exome Sequencing and Whole Genome Sequencing

Proprietary

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Description and Application of the Guidelines

The Carelon Clinical Appropriateness Guidelines (hereinafter “the Carelon Clinical Appropriateness Guidelines” or the “Guidelines”) are designed to assist providers in making the most appropriate treatment decision for a specific clinical condition for an individual. The Guidelines establish objective and evidence-based criteria for medical necessity determinations, where possible, that can be used in support of the following:

- To establish criteria for when services are medically necessary
- To assist the practitioner as an educational tool
- To encourage standardization of medical practice patterns
- To curtail the performance of inappropriate and/or duplicate services
- To address patient safety concerns
- To enhance the quality of health care
- To promote the most efficient and cost-effective use of services

The Carelon guideline development process complies with applicable accreditation and legal standards, including the requirement that the Guidelines be developed with involvement from appropriate providers with current clinical expertise relevant to the Guidelines under review and be based on the most up-to-date clinical principles and best practices. Resources reviewed include widely used treatment guidelines, randomized controlled trials or prospective cohort studies, and large systematic reviews or meta-analyses. Carelon reviews all of its Guidelines at least annually.

Carelon makes its Guidelines publicly available on its website. Copies of the Guidelines are also available upon oral or written request. Additional details, such as summaries of evidence, a list of the sources of evidence, and an explanation of the rationale that supports the adoption of the Guidelines, are included in each guideline document.

Although the Guidelines are publicly available, Carelon considers the Guidelines to be important, proprietary information of Carelon, which cannot be sold, assigned, leased, licensed, reproduced or distributed without the written consent of Carelon.

Carelon applies objective and evidence-based criteria, and takes individual circumstances and the local delivery system into account when determining the medical appropriateness of health care services. The Carelon Guidelines are just guidelines for the provision of specialty health services. These criteria are designed to guide both providers and reviewers to the most appropriate services based on a patient’s unique circumstances. In all cases, clinical judgment consistent with the standards of good medical practice should be used when applying the Guidelines. Guideline determinations are made based on the information provided at the time of the request. It is expected that medical necessity decisions may change as new information is provided or based on unique aspects of the patient’s condition. The treating clinician has final authority and responsibility for treatment decisions regarding the care of the patient and for justifying and demonstrating the existence of medical necessity for the requested service. The Guidelines are not a substitute for the experience and judgment of a physician or other health care professionals. Any clinician seeking to apply or consult the Guidelines is expected to use independent medical judgment in the context of individual clinical circumstances to determine any patient’s care or treatment.

The Guidelines do not address coverage, benefit or other plan specific issues. Applicable federal and state coverage mandates take precedence over these clinical guidelines, and in the case of reviews for Medicare Advantage Plans, the Guidelines are only applied where there are not fully established CMS criteria. If requested by a health plan, Carelon will review requests based on health plan medical policy/guidelines in lieu of the Carelon Guidelines. Use of an FDA approved or conditionally approved product does not constitute medical necessity or guarantee reimbursement by the respective health plan.

The Guidelines may also be used by the health plan or by Carelon for purposes of provider education, or to review the medical necessity of services by any provider who has been notified of the need for medical necessity review, due to billing practices or claims that are not consistent with other providers in terms of frequency or some other manner.

General Clinical Guideline

Clinical Appropriateness Framework

Critical to any finding of clinical appropriateness under the guidelines for a specific diagnostic or therapeutic intervention are the following elements:

- Prior to any intervention, it is essential that the clinician confirm the diagnosis or establish its pretest likelihood based on a complete evaluation of the patient. This includes a history and physical examination and, where applicable, a review of relevant laboratory studies, diagnostic testing, and response to prior therapeutic intervention.
- The anticipated benefit of the recommended intervention is likely to outweigh any potential harms, including from delay or decreased access to services that may result (net benefit).
- Widely used treatment guidelines and/or current clinical literature and/or standards of medical practice should support that the recommended intervention offers the greatest net benefit among competing alternatives.
- There exists a reasonable likelihood that the intervention will change management and/or lead to an improved outcome for the patient.

Providers may be required to submit clinical documentation in support of a request for services. Such documentation must a) accurately reflect the clinical situation at the time of the requested service, and b) sufficiently document the ordering provider's clinical intent.

If these elements are not established with respect to a given request, the determination of appropriateness will most likely require a peer-to-peer conversation to understand the individual and unique facts that would justify a finding of clinical appropriateness. During the peer-to-peer conversation, factors such as patient acuity and setting of service may also be taken into account to the extent permitted by law.

Genetic tests not specifically mentioned in the guidelines are considered not medically necessary.

Simultaneous Ordering of Multiple Diagnostic or Therapeutic Interventions

Requests for multiple diagnostic or therapeutic interventions at the same time will often require a peer-to-peer conversation to understand the individual circumstances that support the medical necessity of performing all interventions simultaneously. This is based on the fact that appropriateness of additional intervention is often dependent on the outcome of the initial intervention.

Additionally, either of the following may apply:

- Current literature and/or standards of medical practice support that one of the requested diagnostic or therapeutic interventions is more appropriate in the clinical situation presented; or
- One of the diagnostic or therapeutic interventions requested is more likely to improve patient outcomes based on current literature and/or standards of medical practice.

Repeat Diagnostic Intervention

In general, repeated testing of the same anatomic location for the same indication should be limited to evaluation following an intervention, or when there is a change in clinical status such that additional testing is required to determine next steps in management. At times, it may be necessary to repeat a test using different techniques or protocols to clarify a finding or result of the original study.

Repeated testing for the same indication using the same or similar technology may be subject to additional review or require peer-to-peer conversation in the following scenarios:

- Repeated diagnostic testing at the same facility due to technical issues

- Repeated diagnostic testing requested at a different facility due to provider preference or quality concerns
- Repeated diagnostic testing of the same anatomic area based on persistent symptoms with no clinical change, treatment, or intervention since the previous study
- Repeated diagnostic testing of the same anatomic area by different providers for the same member over a short period of time

Repeat Therapeutic Intervention

In general, repeated therapeutic intervention in the same anatomic area is considered appropriate when the prior intervention proved effective or beneficial and the expected duration of relief has lapsed. A repeat intervention requested prior to the expected duration of relief is not appropriate unless it can be confirmed that the prior intervention was never administered. Requests for ongoing services may depend on completion of previously authorized services in situations where a patient's response to authorized services is relevant to a determination of clinical appropriateness.

Whole Exome Sequencing and Whole Genome Sequencing

Clinical Indications

Whole Exome Sequencing

Whole exome sequencing (WES) is considered **medically necessary** in the evaluation of an individual[1] who meets **ALL** of the following criteria:

- **ONE** of the following criteria is met:
    - Multiple anomalies (i.e., structural and/or functional) apparent before one year of age not suggestive of a diagnosis detectable with a targeted test[2]
    - For the evaluation of a fetus with abnormal fetal anatomic findings which are characteristic of a genetic abnormality and no diagnostic findings were found on karyotype and/or chromosomal microarray testing
    - Developmental delay, autism spectrum disorders, or intellectual disability with onset prior to 18 years of age with no identifiable cause (idiopathic)
    - Congenital or early onset epilepsy (before age 3 years) without suspected environmental etiology
- When the results of testing would confirm or establish a clinical diagnosis
- Counseling, which encompasses **ALL** of the following components, has been performed:
    - Interpretation of family and medical histories to provide a risk assessment for disease occurrence or recurrence
    - Education about inheritance patterns, genetic testing, disease management, prevention, and resources
    - Counseling to promote informed choices and adaptation to the risk or presence of a genetic condition
    - Counseling for the psychological aspects of genetic testing
    - Counseling should include the following details:
        - Limitations of the testing used
        - A negative result does not indicate heritable risk is zero or low
        - Identification of incidental secondary findings and inconclusive results called variants of uncertain significance is possible
        - Modifications to genetic variants' pathogenicity interpretations can occur, and patients may be recontacted with reclassified results in the future
    - Post-test counseling should be performed for genetic test results

Notes:

1. *WES may include comparator WES testing of the biologic parent(s) or sibling (duo or trio testing) of the affected individual*
2. *Chromosomal microarray analysis (CMA) or targeted gene panel test*

Whole Genome Sequencing

Whole genome sequencing (WGS) is considered **not medically necessary** in the outpatient setting for all indications.

Rationale

Genetic testing is a procedure that involves risk that accompanies its potential benefits. The clinical team and the patient should consider the balance of risks and potential benefits before testing is pursued through informed consent. As with any procedure, the clinical utility of the genetic test must be considered along with its psychological and sociologic implications.[1] Counseling, performed by a genetic counselor and/or team clinician, provides a patient-centered approach to the care of individuals who are undergoing a diagnostic genetic test.[2]

It is also recognized that the accessibility to genetic counselors is limited by available resources as well as other social determinants of health. Therefore, as it relates to screening, the importance should be placed on counseling in a general sense, such as informed consent, as noted above.[3]

Genomic technologies generate large amounts of data, and this increases the potential for uncertainty in managing and adapting to this information.[4] Clinicians are tasked with accurately interpreting and communicating information about test validity and the reliability of test results, as well as the probability for individual patient benefit.[4, 5] Uncovering incidental findings and being overwhelmed with information are important barriers to genetic testing, particularly among vulnerable patient subgroups.[4] Genetic counseling is an invaluable resource for patients undergoing genetic testing, but there are practical limitations because of the scarcity of genetic counselors relative to the current need, as noted above.

Whereas whole exome sequencing (WES) involves sequencing all protein coding regions of the DNA (about 1.5% of the human genome), whole genome sequencing (WGS) entails sequencing all coding (exons) and noncoding (intron) nuclear DNA as well as mitochondrial DNA. In WES, use of DNA samples from both biological parents in addition to the proband (trio testing) is recommended when available. Trio WES analysis reduces analytic cost, highlights de novo changes, precludes the need for numerous low-throughput Sanger cosegregation analyses, and reduces overall turnaround time.[6] The rationale for exploring the role of WGS rather than WES is that some rare genetic diseases involve noncoding structural rearrangements and break points in non-coding regions which are not detected in routine exome analyses.

Research related to WGS testing typically involves careful selection of severely ill patients (often neonates). Congenital anomalies are structural or functional abnormalities usually evident at birth, or shortly thereafter, and can be consequential to an individual's life expectancy, health status, and physical or social functioning.[7] In this setting, clinical geneticists and experienced multidisciplinary teams are typically involved and when a specific illness phenotype is suspected, single gene testing or multi-gene panel testing and sometimes chromosomal microarray testing is pursued with turnaround times of around 4 weeks. WGS testing typically takes 8-12 weeks and has been explored mostly in situations where all other testing is negative or when the seriously ill infant has multiple non-specific phenotypic features.[8] Importantly, pre- and post-test genetic counseling is critically important in this setting. There is research evaluating WGS in highly selected cases as an early single pass test that includes all single nucleotide variants, copy number variations, structural variations, and mitochondrial DNA. Trio analysis is sometimes included, which involves WGS testing not only the affected child but also both parents.

The feasibility of a rapid WGS (rWGS) testing approach was tested using a payor funded, prospective, real-world quality improvement project in the regional ICUs of five tertiary care children's hospitals—Project Baby Bear. Participation was limited to acutely ill Medi-Cal beneficiaries who were admitted November 2018 to May 2020, were < 1 year old and within one week of hospitalization or had just developed an abnormal response to therapy. The primary outcomes evaluated were changes in medical care reported by physicians and changes in the cost of care.[9] Of 184 infants enrolled, 74 (40%) received a diagnosis by rWGS that explained their admission in a median time of 3 days. In 58 (32%) affected individuals, rWGS led to changes in medical care. Testing and precision medicine cost $1.7 million but modeled data suggested cost savings associated with this approach when commercial costs were considered. The savings were not attributable to the diagnostic capability of the rWGS testing as much as acceleration of the diagnostic journey and reduced length of stay in the newborn intensive care unit. The applicability of this ultra-rapid testing to the real world is limited by the limited availability of this testing and the necessity of trio testing (meaning both parents submit specimens along with the child), which enables the rapid 3-day turnaround time.

In 2020, the Pediatric Exome Sequencing/Genome Sequencing Guideline Work Group (Peds ES/GS GWG) was convened to develop an evidence-based guideline for the clinical use of ES/GS in patients with congenital anomalies, developmental delay, or intellectual disability. This working group addressed the question "Should exome sequencing or genome sequencing be used in the evaluation of patients with more than one congenital anomaly apparent before one year of age OR in patients with developmental disability/intellectual disability diagnosed prior to 18 years of age compared to standard testing without exome

or genome sequencing?" The evidence review involved 36 studies where the patient population was greater than twenty. The authors concluded that WES or WGS testing has a higher diagnostic yield and may be more cost effective when ordered early in the diagnostic evaluation.[7]

A more recent systematic review examining the role of genomic medicine with WES or WGS testing in critically ill infants was conducted with data from 21 studies reflecting results from 1654 patients. A mean of 46% (range, 15%-72%) of patients had a positive genetic test result, and a mean of 37% (range, 13%-61%) met the criteria for experiencing utility.[10] This review found that studies disproportionally highlighted patient cases that resulted in treatment change, and larger studies reported substantially lower utility. The authors concluded that a more complete definition of utility that is used consistently may improve understanding of potential benefits and harms of this testing of critically ill infants. An editorial related to this systematic review emphasized that strengthening the rigor with which utility is measured is critically important and may serve as the foundation for evaluation of genomic medicine in other clinical contexts outside of neonatal intensive care.[11]

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Codes

The following code list is not meant to be all-inclusive. Authorization requirements will vary by health plan. Please consult the applicable health plan for guidance on specific procedure codes.

Specific CPT codes for services should be used when available. Nonspecific or not otherwise classified codes may be subject to additional documentation requirements and review.

CPT/HCPCS

May Be Medically Necessary When Criteria are Met

Code	May Be Medically Necessary When Criteria are Met
81415	Exome (eg, unexplained constitutional or heritable disorder or syndrome); sequence analysis
81416	Exome (eg, unexplained constitutional or heritable disorder or syndrome); sequence analysis, each comparator exome (eg, parents, siblings)

Code	May Be Medically Necessary When Criteria are Met
81417	Exome (eg, unexplained constitutional or heritable disorder or syndrome); re-evaluation of previously obtained exome sequence (eg, updated knowledge or unrelated condition/syndrome)

Not Medically Necessary

Code	Not Medically Necessary
81425	Genome (eg, unexplained constitutional or heritable disorder or syndrome); sequence analysis
81426	Genome (eg, unexplained constitutional or heritable disorder or syndrome); sequence analysis, each comparator exome (eg, parents, siblings)
81427	Genome (eg, unexplained constitutional or heritable disorder or syndrome); re-evaluation of previously obtained genome sequence (eg, updated knowledge or unrelated condition/syndrome)
81460	Whole mitochondrial genome (eg, Leigh syndrome, mitochondrial encephalomyopathy, lactic acidosis, and stroke-like episodes [MELAS], myoclonic epilepsy with ragged-red fibers [MERFF], neuropathy, ataxia, and retinitis pigmentosa [NARP], Leber hereditary optic neuropathy [LHON]), genomic sequence, must include sequence analysis of entire mitochondrial genome with heteroplasmy detection
81465	Whole mitochondrial genome large deletion analysis panel (eg, Kearns-Sayre syndrome, chronic progressive external ophthalmoplegia), including heteroplasmy detection if performed
0094U	Genome (eg, unexplained constitutional or heritable disorder or syndrome), rapid sequence analysis
0156U	Copy number (eg, intellectual disability, dysmorphology), sequence analysis
0212U	Rare diseases (constitutional/heritable disorders), whole genome and mitochondrial DNA sequence analysis, including small sequence changes, deletions, duplications, short tandem repeat gene expansions, and variants in non-uniquely mappable regions, blood or saliva, identification and categorization of genetic variants, proband (Do not report 0212U in conjunction with 81425)
0213U	Rare diseases (constitutional/heritable disorders), whole genome and mitochondrial DNA sequence analysis, including small sequence changes, deletions, duplications, short tandem repeat gene expansions, and variants in non-uniquely mappable regions, blood or saliva, identification and categorization of genetic variants, each comparator genome (eg, parent, sibling)
0214U	Rare diseases (constitutional/heritable disorders), whole exome and mitochondrial DNA sequence analysis, including small sequence changes, deletions, duplications, short tandem repeat gene expansions, and variants in non-uniquely mappable regions, blood or saliva, identification and categorization of genetic variants, proband
0215U	Rare diseases (constitutional/heritable disorders), whole exome and mitochondrial DNA sequence analysis, including small sequence changes, deletions, duplications, short tandem repeat gene expansions, and variants in non-uniquely mappable regions, blood or saliva, identification and categorization of genetic variants, each comparator exome (eg, parent, sibling)
0265U	Rare constitutional and other heritable disorders, whole genome and mitochondrial DNA sequence analysis, blood, frozen and formalin-fixed paraffin embedded (FFPE) tissue, saliva, buccal swabs or cell lines, identification of single nucleotide and copy number variants
0266U	Unexplained constitutional or other heritable disorders or syndromes, tissue specific gene expression by whole transcriptome and next-generation sequencing, blood, formalin-fixed paraffin embedded (FFPE) tissue or fresh frozen tissue, reported as presence or absence of splicing or expression changes
0267U	Rare constitutional and other heritable disorders, identification of copy number variations, inversions, insertions, translocations, and other structural variants by optical genome mapping and whole genome sequencing
0335U	Rare diseases (constitutional/heritable disorders), whole genome sequence analysis, including small sequence changes, copy number variants, deletions, duplications, mobile element insertions, uniparental disomy (UPD), inversions, aneuploidy, mitochondrial genome sequence analysis with heteroplasmy and large deletions, short tandem repeat (STR) gene expansions, fetal sample, identification and categorization of genetic variants (Do not report 0335U in conjunction with 81425, 0212U)
0336U	Rare diseases (constitutional/heritable disorders), whole genome sequence analysis, including small sequence changes, copy number variants, deletions, duplications, mobile element insertions, uniparental disomy (UPD), inversions, aneuploidy, mitochondrial genome sequence analysis with heteroplasmy and large deletions, short tandem repeat (STR) gene expansions, blood or saliva, identification and categorization of genetic variants, each comparator genome (eg, parent) (Do not report 0336U in conjunction with 81426, 0213U)
0417U	Rare diseases (constitutional/heritable disorders), whole mitochondrial genome sequence with heteroplasmy detection and deletion analysis, nuclear-encoded mitochondrial gene analysis of 335 nuclear genes, including sequence changes, deletions, insertions, and copy number variants analysis, blood or saliva, identification and categorization of mitochondrial disorder-associated genetic variants
0425U	Genome (eg, unexplained constitutional or heritable disorder or syndrome), rapid sequence analysis, each comparator genome (eg, parents, siblings)
0426U	Genome (eg, unexplained constitutional or heritable disorder or syndrome), ultra-rapid sequence analysis
0532U	Rare diseases (constitutional disease/hereditary disorders), rapid whole genome and mitochondrial DNA sequencing for single nucleotide variants, insertions/deletions, copy number variations, peripheral blood, buffy coat, saliva, buccal or tissue sample, results reported as positive or negative

ICD-10 Diagnosis

Refer to the ICD-10 CM manual

History

Status	Review Date	Effective Date	Action
Updated codes 04/01/2025	n/a	Unchanged	Added CPT code 0532U (NMN). Removed 81455, 0036U, 0297U, 0300U, 0410U (NMN).
Revised	01/23/2024	10/20/2024	Independent Multispecialty Physician Panel (IMPP) review. WES criteria expanded to include congenital or early onset epilepsy without suspected environmental etiology. Clarified well-delineated genetic syndrome in criterion for multiple anomalies. Clarified Genetic Counseling details for WES. Added references.
Updated codes 10/01/2024	n/a	Unchanged	Removed CPT code 81440. Removed/Moved CPT codes 0260U, 0264U, 0299U, 0331U, and 0469U to Chromosomal Microarray Analysis guideline.
Updated codes 07/01/2024	n/a	Unchanged	Added CPT code 0469U (NMN).
Updated codes 03/17/2024	n/a	Unchanged	Split code list into those considered medically necessary when criteria are met (MNWCM) and not MN. Added NMN CPT codes 0156U and 0297U. Added required language to General Clinical Guideline per new Medicare regulations.
Updated	n/a	01/01/2024	Added CPT codes 81440, 81455, 0299U, 0300U, 0331U, 0410U, 0417U, 0425U, and 0426U. Removed 0012U.
Created	09/21/2022	02/12/2023	IMPP review. Original effective date.