Cohere Medical Policy -
3D Rendering of Imaging Studies

Clinical Policy for Medical Necessity Review

Version: 2
Cohere Health UMC Approval Date: December 11, 2025
Last Annual Review: December 11, 2025
Revision: Not Applicable
Next Annual Review: December 11, 2026

Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

Cohere Health, Inc. ("**Cohere**") has published these clinical guidelines to determine the medical necessity of services (the "**Guidelines**") for informational purposes only, and solely for use by Cohere's authorized "**End Users**". These Guidelines (and any attachments or linked third-party content) are not intended to be a substitute for medical advice, diagnosis, or treatment directed by an appropriately licensed healthcare professional. These Guidelines are not in any way intended to support clinical decision-making of any kind; their sole purpose and intended use is to summarize certain criteria Cohere may use when reviewing the medical necessity of any service requests submitted to Cohere by End Users. Always seek the advice of a qualified healthcare professional regarding any medical questions, treatment decisions, or other clinical guidance. The Guidelines, including any attachments or linked content, are subject to change at any time without notice.

Other Notices:

Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Cohere Medical Policy - 3D Rendering of Imaging Studies
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

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Medical Necessity Criteria

Service: 3D Rendering of Imaging Studies

Cohere Health takes an evidence-based approach to reviewing imaging and procedure requests, meaning that sufficient clinical information must be provided at the time of submission to determine medical necessity. Documentation must include a recent and detailed history, physical examination related to the onset or change in symptoms, relevant lab results, prior imaging, and details of previous treatments. Advanced imaging or procedures should be requested after a clinical evaluation by the treating provider, which may include a referral to a specialist.

- When a specific clinical indication is not explicitly addressed in the Cohere Health medical policy, medical necessity will be determined based on established clinical best practices, as supported by evidence-based literature, peer-reviewed sources, professional society guidelines, and state or national recommendations, unless otherwise directed by the health plan.
- Requests submitted without clinical documentation, or those that do not align with the provided clinical information—such as mismatched laterality, body part, or CPT code—may be denied for lack of medical necessity due to insufficient or inconsistent clinical information.
- Repeat diagnostic testing due to technical issues—such as patient motion, incomplete exams, or incorrect imaging sequences—may not be considered medically necessary, as it is the responsibility of the imaging center to deliver appropriate, high-quality studies as originally authorized. Similarly, repeat imaging requested at a different facility based solely on provider preference may not be approved for medical necessity.
- When there are multiple diagnostic or therapeutic procedures requested simultaneously, or within the past 3 months, each will be reviewed independently. Clinical documentation must clearly justify all of the following:
    - The medical necessity of each individual request

    - Why prior imaging or procedures were inconclusive, or why additional/follow-up studies are needed
    - How the results will impact patient management or treatment decisions
- Requests involving adjacent or contiguous body parts may be considered not medically necessary if the documentation demonstrates that the patient's primary symptoms can be adequately assessed with a single study or procedure.
- Cohere Health evaluates imaging exams based on medical necessity, regardless of contrast use. If an initial non-contrast study is completed and the radiologist later determines that contrast is needed to clarify a finding, the original authorization number may be used—provided the contrast-enhanced exam is performed at the same imaging center and within the original request's validity period, unless otherwise directed by the health plan.

Description

Three-dimensional (3D) rendering of imaging studies is a technique that is performed by organizing thin sections of 2D images to reconstruct a 3D image. The resulting 3D image can enhance the visualization of hard-to-visualize structures, thereby helping to better understand a pathology and guide clinical management. This technique is also known as 3D reconstruction or 3D reformation. 3D rendering can be performed for ultrasound (US), echocardiography, computed tomography (CT), magnetic resonance imaging (MRI), magnetic resonance angiography (MRA), computed tomography angiography (CTA), digital subtraction angiography (DSA), and other tomographic imaging modalities.

Medical Necessity Criteria

Indications

3D rendering of imaging studies, when performed for transesophageal echocardiography (TEE) or transthoracic echocardiography (TTE), is considered appropriate when **ANY** of the following are **TRUE**:

- The procedure is a 3D echocardiography with TEE for **ANY** of the following:
  - Preoperative planning of valve repair for multiple etiologies of mitral regurgitation[1]; **OR**
  - In the assessment of mitral stenosis and the accurate calculation of mitral valve area[2]; **OR**
  - Preoperative planning for diagnosis and treatment of atrial septal defects[3]; **OR**
  - Preoperative and intraoperative planning for interventional cardiac procedures (e.g., transcatheter placement of occluders for atrial septal defect or patent foramen ovale, or paravalvular dehiscence or leak)[4,5]; **OR**
  - Intraoperative mapping for atrial ablation procedures[4,6]; **OR**
  - Evaluation of tricuspid valve disease[7]; **OR**
- The procedure is a 3D echocardiography with TTE for **ANY** of the following:
  - Pre-operative planning in patients who will be having surgery to repair mitral valve prolapse[8]; **OR**
  - Monitoring the mitral valve area in patients with moderate to severe mitral stenosis.[9]

3D rendering of imaging studies is considered appropriate when **ALL** of the following are **TRUE**:

- Complete diagnostic information that would be critical to clinical management cannot be ascertained through traditional (2D or multiplanar reformatted) imaging; **AND**
- An associated imaging study is clearly identified (e.g., ultrasound, computed tomography [CT], magnetic resonance imaging [MRI], angiography, etc.); **AND**
- **ANY** of the following:
  - Preoperative planning is required for a complex surgical case[1]; **OR**
  - Known or suspected tumor with invasion of adjacent structures, such that 3D imaging may impact treatment[10-14]; **OR**

- Vascular system pathology with planned procedural intervention, including **ANY** of the following[15-24]:
  - Aneurysms; **OR**
  - Vascular abnormalities or malformations; **OR**
- Congenital heart disease, and **ANY** of the following[25]:
  - Initial diagnosis; **OR**
  - Presurgical planning; **OR**
  - Volumetric or anatomical assessment is required for surveillance or postoperative evaluation; **OR**
- Preprocedural and postprocedural evaluation of organ transplantation; **OR**
- Orthopedic imaging for preoperative planning of **ANY** of the following procedures[26-31]:
  - Acetabular osteotomy; **OR**
  - Facial trauma; **OR**
  - Intra-articular fracture; **OR**
  - Other complex fractures with or without dislocation of any joint; **OR**
  - Spine surgery; **OR**
- Evaluation of congenital craniofacial abnormalities; **OR**
- Other not previously specified conditions where 3D image rendering would provide information that cannot otherwise be obtained by traditional 2D imaging or multiplanar reformatted images, and such information is critical to clinical management.[32-34]

Repeat imaging is considered appropriate when **ALL** of the following are **TRUE**:

- Repeat request following recent imaging within the past 3 months of the same anatomic region with the same or similar modality; **AND**
- No established guidelines for repeat imaging; **AND**
- **ANY** of the following:
  - Need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
  - New or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
  - No change in symptoms and a well-established clinical need for ongoing monitoring that will influence management.

Non-Indications

3D rendering of imaging studies is not considered appropriate if **ANY** of the following is **TRUE**:

- The request is in conjunction with an imaging study that is considered not medically necessary; **OR**
- The request is for 3D rendering alone without documentation of an associated imaging study and the reasons for the study[35]; **OR**
- The request is for CTA, CCTA, or MRA, as 3D rendering is considered inclusive in such imaging (e.g., CPT 75572, 75573, 75574)[36-38]; **OR**
- The request is for 3D echocardiographic imaging and postprocessing for TEE or TTE exams, as 3D rendering is considered inclusive in such requests (e.g., 93319, 93355)[7]; **OR**
- Routine use by the imaging facility without specifically being ordered by the requesting physician.

Level of Care Criteria

Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
76376	3D rendering with interpretation and reporting of computed tomography, magnetic resonance imaging, ultrasound, or other tomographic modality with image postprocessing under concurrent supervision; not requiring image postprocessing on an independent workstation
76377	3D rendering with interpretation and reporting of computed tomography, magnetic resonance imaging, ultrasound, or other tomographic modality with image postprocessing under concurrent supervision; requiring image postprocessing on an independent workstation

Medical Evidence

Timmins et al. (2022) conducted 3D morphology measurements of 127 unruptured intracranial aneurysms in 112 patients to investigate the relationship between change in aneurysm size and 3D morphologic changes. The types of 3D measurements assessed included surface area, compactness, elongation, flatness, sphericity, shape index, and curvedness, with categoric growth defined as at least a 1 mm increase in 2D length or width. The authors found that the continuous growth of an unruptured intracranial aneurysm was associated with an increase in surface area and flatness. They also found an inverse association between growth and shape index and curvedness. The authors concluded that further studies are required to determine if morphologic change and/or size can predict aneurysm rupture.[17]

Ghulam et al. (2020) compared interoperator reproducibility among non-physician ultrasound technicians when performing both 2D and 3D ultrasound for the surveillance of abdominal aortic aneurysms. 90 patients with asymptomatic infrarenal abdominal aortic aneurysm underwent ultrasound imaging to measure the maximum diameter of the aneurysm. Interoperator reproducibility was found to be superior for 3D ultrasound compared to 2D ultrasound (intraclass correlation 0.97 vs. 0.93, respectively).[21]

Thong et al. (2016) analyzed 3D reconstructions of 915 spinal radiographs from 663 adolescent patients with scoliosis, using a machine learning algorithm to identify potential subgroupings within this population. Overall, the machine learning algorithm identified eleven unique subgroups. The main discriminating factors were the location of the main curve, kyphosis, and lordosis. This algorithm could prove helpful in simplifying 3D spine models without compromising the complexity of the measured parameters.[28]

3D medical imaging and 3D printing tools have rapidly expanded clinical care. A recent review (Christensen and Rybicki, 2017) emphasized that 3D printing relies entirely on the accuracy of the originating imaging study, because the volumetric dataset determines the anatomical models used for surgical planning, education, or template creation.[35] The authors emphasized that 3D printing does not replace imaging, but rather extends visualization.[35]

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Policy Revision History/Information

Original Date: November 21, 2024		
Review History		
Version 2	12/11/2025	Annual review. Added indications for TEE and TTE. Added indications to require that the associated imaging study be clearly identified. Added indications for congenital heart disease. Added non-indications for 3D rendering alone without documentation of an associated imaging study and the reasons for the study; for CTA, CCTA, or MRA; and for 3D echocardiographic imaging and postprocessing for TEE or TTE exams. Updated medical evidence summaries and references.