

Molina Clinical Policy

Transcatheter Tricuspid Valve Replacement for Tricuspid Valve Disease: Policy No. 368

Last Approval: 8/10/2022

Next Review Due By: August 2023



DISCLAIMER

This Molina Clinical Policy (MCP) is intended to facilitate the Utilization Management process. Policies are not a supplementation or recommendation for treatment; Providers are solely responsible for the diagnosis, treatment and clinical recommendations for the Member. It expresses Molina's determination as to whether certain services or supplies are medically necessary, experimental, investigational, or cosmetic for purposes of determining appropriateness of payment. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that this service or supply is covered (e.g., will be paid for by Molina) for a particular Member. The Member's benefit plan determines coverage – each benefit plan defines which services are covered, which are excluded, and which are subject to dollar caps or other limits. Members and their Providers will need to consult the Member's benefit plan to determine if there are any exclusion(s) or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and a Member's plan of benefits, the benefits plan will govern. In addition, coverage may be mandated by applicable legal requirements of a State, the Federal government or CMS for Medicare and Medicaid Members. CMS's Coverage Database can be found on the CMS website. The coverage directive(s) and criteria from an existing National Coverage Determination (NCD) or Local Coverage Determination (LCD) will supersede the contents of this MCP and provide the directive for all Medicare members. References included were accurate at the time of policy approval and publication.

OVERVIEW

Tricuspid valve disease is a condition in which the valve between the two right heart chambers (right ventricle and right atrium) does not function properly. Tricuspid valve disease often occurs with other heart valve problems. Tricuspid regurgitation (TR) is a commonly encountered manifestation of valvular heart disease. The majority of patients with TR have mild disease that is classified as nonpathological or a normal variant. These patients can remain asymptomatic for some time. Moderate-to-severe TR is usually considered pathological and is associated with poor prognosis. The prevalence of moderate-to-severe TR in the United States has been reported to be greater than 1.6 million. With severe TR, 1-year mortality increases and may reach greater than 36%. Surgical repair of TR is generally reserved for patients with advanced disease. These patients are often high-risk candidates for open surgical procedures, making the percutaneous or transcatheter minimally invasive approach attractive for this population. The current standard of care is open surgical valve replacement or repair surgery. (Otto, 2022; Hayes, 2019).

Transcatheter heart valve replacement and repair are relatively new interventional procedures involving the insertion of an artificial heart valve or repair device using a catheter, rather than through open heart surgery, or surgical valve replacement (SAVR). The point of entry is typically either the femoral vein (antegrade) or femoral artery (retrograde), or directly through the myocardium via the apical region of the heart. For valve replacement surgery, an expandable prosthetic heart valve is pressed onto a catheter and then deployed at the site of the diseased native valve. For valve repair, a small device is deployed by catheter to the valve where the faulty leaflets are clipped together to reduce regurgitation. The percutaneous transcatheter heart valve surgery procedure usually takes less time to perform and is less invasive than open heart surgery. Potential disadvantages of transcatheter heart valve surgery include a greater risk for valve migration, complications associated with catheter-based delivery, and uncertain valve device durability. Surgical repair of tricuspid valve is generally reserved for patients with advanced disease. These patients are often high-risk candidates for open surgical procedures, making the percutaneous or transcatheter minimally invasive approach attractive for this population. The development of devices specifically designed for percutaneous or transcatheter tricuspid valve replacement (TTVR) is currently at an early stage. (Otto, 2022; Hayes, 2019).

According to the Food and Drug Administration (FDA), no transcatheter tricuspid valves are currently approved for use in the United States. Multiple transcatheter devices intended for mitral, aortic, and pulmonic valve positions have been FDA approved. Use of any of these devices in the tricuspid position would be considered off-label. There are early studies evaluating use of several TTVR devices. (¹⁻⁴ ClinicalTrials.gov, 2021; ClinicalTrials.gov, 2020 & 2016).

COVERAGE POLICY

Transcatheter tricuspid valve replacement for tricuspid valve disease **is considered experimental, investigational, and unproven** due to insufficient published evidence to assess the safety and/or impact on health outcomes of transcatheter tricuspid valve replacement in patients with diseased tricuspid valves. (AMR, 2020; Arsalan, 2017).

Molina Clinical Policy

Transcatheter Tricuspid Valve Replacement for Tricuspid Valve Disease: Policy No. 368

Last Approval: 8/10/2022

Next Review Due By: August 2023



DOCUMENTATION REQUIREMENTS. Molina Healthcare reserves the right to require that additional documentation be made available as part of its coverage determination; quality improvement; and fraud; waste and abuse prevention processes. Documentation required may include, but is not limited to, patient records, test results and credentials of the provider ordering or performing a drug or service. Molina Healthcare may deny reimbursement or take additional appropriate action if the documentation provided does not support the initial determination that the drugs or services were medically necessary, not investigational or experimental, and otherwise within the scope of benefits afforded to the member, and/or the documentation demonstrates a pattern of billing or other practice that is inappropriate or excessive.

SUMMARY OF MEDICAL EVIDENCE

At the current time there is a paucity of peer reviewed literature to evaluate the safety and/or impact on health outcomes of transcatheter tricuspid valve replacement in patients with diseased native tricuspid valves. Publications include mostly small case series. There is one large (n=312) prospective study and a small (n=30) single-arm, multicenter, prospective trial are outlined below. For (additional) peer-reviewed studies used in the development and update of this policy, please see the *Reference* section.

Taramasso et al. (2019) reported on a large, prospective international registry was developed to evaluate the initial clinical applications of transcatheter tricuspid valve intervention (TTVI) with different devices. TTVI for native tricuspid valve dysfunction has been emerging during the last few years as an alternative therapeutic option to serve a large high-risk population of patients with severe symptomatic tricuspid regurgitation (TR). The TriValve Registry included 312 high-risk patients with severe TR (76.4 +/- 8.5 years of age; 57% female; EuroSCORE II 9 +/- 8%) at 18 centers. Interventions included repair at the level of the leaflets (MitraClip, Abbott Vascular, Santa Clara, California; PASCAL Edwards Lifesciences, Irvine, California), annulus (Cardioband, Edwards Lifesciences; TriCinch, 4tech, Galway, Ireland; Trialign, Mitraling, Tewksbury, Massachusetts), or coaptation (FORMA, Edwards Lifesciences) and replacement (Caval Implants, NaviGate, NaviGate Cardiac Structures, Lake Forest, California). Clinical outcomes were prospectively determined during mid-term follow-up. A total of 108 patients (34.6%) had prior left heart valve intervention (84 surgical and 24 transcatheter, respectively). TR etiology was functional in 93%, and mean annular diameter was 46.9 +/- 9 mm. In 75% of patients the regurgitant jet was central (vena contracta 1.1 +/- 0.5; effective regurgitant orifice area 0.78 +/- 0.6 cm²). Pre-procedural systolic pulmonary artery pressure was 41 +/- 14.8 mm Hg. Implanted devices included: MitraClip in 210 cases, Trialign in 18 cases, TriCinch first generation in 14 cases, caval valve implantation in 30 cases, FORMA in 24 cases, Cardioband in 13 cases, NaviGate in 6 cases, and PASCAL in 1. In 64% of the cases, TTVI was performed as a stand-alone procedure. Procedural success (defined as the device successfully implanted and residual TR). The report concluded that TTVI is feasible with different technologies, has a reasonable overall procedural success rate, and is associated with low mortality and significant clinical improvement. Mid-term survival is favorable in this high-risk population. Greater coaptation depth is associated with reduced procedural success, which is an independent predictor of mortality.

Nickenig et al. (2019) report the 6-month safety and performance of a transcatheter tricuspid valve reconstruction system in the treatment of moderate to severe functional TR in 30 patients enrolled in the TRI-REPAIR (Tricuspid Regurgitation RePAIR With CaRdioband Transcatheter System) study. Between October 2016 and July 2017, 30 patients were enrolled in this single-arm, multicenter, prospective trial. Patients were diagnosed with moderate to severe, symptomatic TR in the absence of untreated left-heart disease and deemed inoperable because of unacceptable risk for open-heart surgery by the local heart team. Clinical, functional, and echocardiographic data were prospectively collected before and up to 6 months post-procedure. An independent core lab assessed all echocardiographic data, and an independent clinical event committee adjudicated the safety events. Mean patient age was 75 years, 73% were female, and 23% had ischemic heart disease. At baseline, 83% were in New York Heart Association (NYHA) functional class III to IV, and mean left ventricular ejection fraction was 58%. Technical success was 100%. Through 6 months, 3 patients died. Between 6 months and baseline, echocardiography showed average reductions of annular septolateral diameter of 9% (42 mm vs. 38 mm; p <0.01), proximal isovelocity surface area effective regurgitant orifice area of 50% (0.8 cm² vs. 0.4 cm²; p <0.01), and mean vena contracta width of 28% (1.2 cm vs. 0.9 cm; p <0.01). Clinical assessment showed that 76% of patients improved by at least 1 NYHA functional class with 88% in NYHA functional class I or II. Six-minute walk distance improved by 60 m (p <0.01), and Kansas City Cardiomyopathy Questionnaire score improved by 24 points (p <0.01). In conclusion, six-month outcomes show that the system performs as intended and appears to be safe in patients with symptomatic and moderate to severe functional TR. Significant reduction of TR through decrease of annular dimensions, improvements in heart failure symptoms, quality of life, and exercise capacity were observed. Further studies are warranted to validate these initial promising results.

Molina Clinical Policy

Transcatheter Tricuspid Valve Replacement for Tricuspid Valve Disease: Policy No. 368

Last Approval: 8/10/2022
Next Review Due By: August 2023



National and Specialty Organizations

The American Heart Association (AHA) and the American College of Cardiology (ACC) (Otto et al., 2021) published the *Guideline for the Management of Patients with Valvular Heart Disease*. Recommendations for the evaluation and management of VHD continue to be based on clinical experience and observational studies, with prospective RCTs limited mostly to new devices. The guideline recommends that research on valve disease span the spectrum from basic science to prospective randomized trials – research should include medical therapy and studies should focus on each stage of the disease process (e.g., from the patient at risk to the patient with end-stage disease).

The European Society of Cardiology Working Groups of Cardiovascular Surgery and Valvular Heart Disease (Antunes et al., 2017) published a position statement on the *Management of Tricuspid Valve Regurgitation*. Percutaneous tricuspid valve intervention (both repair and replacement) is still in its infancy but may become a reliable option in future, especially for high-risk patients with isolated primary TR or with secondary TR related to advanced left-sided heart valve disease.

SUPPLEMENTAL INFORMATION

None.

CODING & BILLING INFORMATION

CPT Codes

CPT	Description
33999	Unlisted procedure cardiac surgery
0545T	Transcatheter tricuspid valve annulus reconstruction with implantation of adjustable annulus
0569T	Transcatheter tricuspid valve repair, percutaneous approach; initial prosthesis
0570T	Transcatheter tricuspid valve repair, percutaneous approach; each additional prosthesis during same session (List separately in addition to code for primary procedure)
0646T	Transcatheter tricuspid valve implantation/replacement (TTVI) with prosthetic valve, percutaneous approach, including right heart catheterization, temporary pacemaker insertion, and selective right ventricular or right atrial angiography, when performed

HCPCS Codes – None.

ICD-10 Codes – Any / All.

CODING DISCLAIMER. Codes listed in this policy are for reference purposes only and may not be all-inclusive. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement. Listing of a service or device code in this policy does not guarantee coverage. Coverage is determined by the benefit document. Molina adheres to Current Procedural Terminology (CPT®), a registered trademark of the American Medical Association (AMA). All CPT codes and descriptions are copyrighted by the AMA; this information is included for informational purposes only. Providers and facilities are expected to utilize industry standard coding practices for all submissions. When improper billing and coding is not followed, Molina has the right to reject/deny the claim and recover claim payment(s). Due to changing industry practices, Molina reserves the right to revise this policy as needed.

APPROVAL HISTORY

8/10/2022	Policy reviewed, no changes to coverage criteria. Updated Summary of Medical Evidence and Reference sections.
8/13/2021	Policy reviewed, no changes, updated references.
6/17/2020	New policy.

REFERENCES

Government Agencies

- Centers for Medicare and Medicaid Services (CMS). Medicare coverage database (no National Coverage Determination identified). Available from [CMS](#). Accessed July 14, 2022.

Molina Clinical Policy

Transcatheter Tricuspid Valve Replacement for Tricuspid Valve Disease: Policy No. 368



Last Approval: 8/10/2022

Next Review Due By: August 2023

- 1 Clinical Trials.gov. Study with Abbott transcatheter clip repair system in patients with moderate or greater TR (TRILUMINATE) (identifier: NCT03227757). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated December 23, 2021. Accessed July 14, 2022.
- 2 Clinical Trials.gov. Edwards cardioband tricuspid valve reconstruction system early feasibility study (identifier: NCT03382457). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated November 11, 2021. Accessed July 14, 2022.
- 3 Clinical Trials.gov. Transcatheter repair of tricuspid regurgitation with Edwards Cardioband TR System post market study (TriBAND) (identifier: NCT03779490). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated May 4, 2021. Accessed July 14, 2022.
- 4 Clinical Trials.gov. Tricuspid regurgitation repair with cardioband transcatheter system (TRI-REPAIR) (identifier: NCT02981953). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated June 28, 2021. Accessed July 14, 2022.
- 5 Clinical Trials.gov. Repair of tricuspid valve regurgitation using the Edwards Tricuspid Transcatheter Repair System (SPACER trial) (identifier: NCT02787408). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated April 22, 2020. Accessed July 14, 2022.
- 6 Clinical Trials.gov. MitraClip for severe TR (TVrepair) (identifier: NCT02863549). Available from [ClinicalTrials.gov](https://clinicaltrials.gov). Updated August 11, 2016. Accessed July 14, 2022.

Evidence Based Reviews and Publications

1. AMR Peer Review. Policy reviewed on April 19, 2020 by an Advanced Medical Reviews (AMR) practicing, board-certified physician in the areas of Cardiovascular Disease, Interventional Cardiology and Internal Medicine. Accessed July 12, 2021.
2. Hayes. Evidence analysis research brief: Transcatheter tricuspid valve replacement for tricuspid valve disease. Available from [Hayes](https://www.hayes.com). Updated August 8, 2019. Archived September 8, 2020. Accessed July 14, 2022. Registration and login required.
3. Otto CM. Management and prognosis of tricuspid regurgitation. Available from [UpToDate](https://www.upToDate.com). Updated February 9, 2022. Accessed July 14, 2022. Registration and login required.

Peer Reviewed Publications

1. Taramasso M, Alessandrini H, Latib A, et al. Outcomes after current transcatheter tricuspid valve intervention: Mid-term results from the International TriValve Registry. *JACC Cardiovasc Interv*. 2019 Jan 28;12(2):155-165. doi: 10.1016/j.jcin.2018.10.022.
2. Nickenig G, Weber M, Schueler R, et al. 6-month outcomes of tricuspid valve reconstruction for patients with severe tricuspid regurgitation. *J Am Coll Cardiol*. 2019 Apr 23;73(15):1905-1915. doi: 10.1016/j.jacc.2019.01.062. Accessed July 14, 2022.
3. Arsalan M, Arsalan M, Walther T, Smith RL, Grayburn PA. Tricuspid regurgitation diagnosis and treatment. *Eur Heart J*. 2017 Mar 1;38(9):634-638. doi: 10.1093/eurheartj/ehv487. Accessed July 16, 2021.

National and Specialty Organizations

1. Antunes MJ, Rodriguez-Palomares J, Prendergast B, et al. Management of tricuspid valve regurgitation: Position statement of the European Society of Cardiology Working Groups of Cardiovascular Surgery and Valvular Heart Disease. *Eur J Cardiothorac Surg*. 2017 Dec 1;52(6):1022-1030. doi: 10.1093/ejcts/ezx279. Accessed July 14, 2022.
2. Otto CM, Nishimura RA, Bonow RO, Carabello BA, Erwin III JP, Gentile F, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*. 2021;143(5):e72-e227. <https://doi.org/10.1161/CIR.0000000000000923>. Accessed July 12, 2022.

Other Peer Reviewed and National Organization Publications (used in the development of this policy)

1. Asmarats L, Dagenais F, Bedard E, et al. Transcatheter tricuspid valve replacement for treating severe tricuspid regurgitation: initial experience with the NaviGate bioprosthesis. *Can J Cardiol*. 2018;Oct;34(10):1370.e1375-1370.e1377. Accessed July 14, 2022.
2. Baumgartner H, Falk V, Bax JJ, et al. 2017 ESC/EACTS guidelines for the management of valvular heart disease. *Eur Heart J* 2017; 38:2739. <https://doi.org/10.1093/eurheartj/ehx391>. Accessed July 14, 2022.
3. Curio, J, et al. Update on the current landscape of transcatheter options for tricuspid regurgitation treatment. *Interv Cardiol*. 2019 May; 14(2): 54–61. doi: 10.15420/icr.2019.5.1. Accessed July 14, 2022.
4. Hahn RT, George I, Kodali SK, et al. Early single-site experience with transcatheter tricuspid valve replacement. *J Am Coll Cardiol Img*. 2019 Mar, 12 (3) 416-429. <https://www.jacc.org/doi/10.1016/j.jcmg.2018.08.034>. Accessed July 14, 2022.
5. Hahn RT, Meduri CU, Davidson CJ, et al. Early feasibility study of a transcatheter tricuspid valve annuloplasty: SCOUT trial 30-day results. *J Am Coll Cardiol*. 2017 Apr 11;69(14):1795-1806. doi: 10.1016/j.jacc.2017.01.054. Accessed July 14, 2022.
6. Levi DS, Sinha S, Salem MM, Aboulhossn JA. Transcatheter native pulmonary valve and tricuspid valve replacement with the sapien XT: Initial experience and development of a new delivery platform. *Catheter Cardiovasc Interv*. 2016 Sep;88(3):434-43. doi: 10.1002/ccd.26398. Accessed July 14, 2022.
7. Nishimura RA, Otto CM, Bonow RO, et al. 2017 AHA/ACC Focused Update of the 2014 AHA/ACC guideline for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2017 Jun 20;135(25):e1159-e1195. doi: 10.1161/CIR.0000000000000503. Accessed 14, 2022.
8. Ozam M, et al. Transcatheter tricuspid valve replacement: principles and design. *Front Cardiovasc Med*. 2018 Sep 19;5:129. doi: 10.3389/fcvm.2018.00129. Accessed July 14, 2022.
9. Perlman G, Praz F, Puri R, et al. Transcatheter tricuspid valve repair with a new transcatheter coaptation system for the treatment of severe tricuspid regurgitation: 1-year clinical and echocardiographic results. *JACC Cardiovasc Interv*. 2017 Oct 9;10(19):1994-2003. doi: 10.1016/j.jcin.2017.06.036. Accessed July 14, 2022.
10. Ranocchi F1, Nicolò F, et al. Minimally invasive implantation of a Sapien 3 ultra valve in a degenerated tricuspid bioprosthesis. *J Card Surg*. 2020 Apr 25. doi: 10.1111/jocs.14572. Accessed July 14, 2022.
11. Regazzoli D, Ielasi A, Lanzillo G, et al. Sustained Reduction of Tricuspid Regurgitation after Percutaneous Repair with the MitraClip System in a Patient with a Dual Chamber Pacemaker. *JACC Cardiovasc Interv*. 2017 Aug 28;10(16):e147-e149. doi: 10.1016/j.jcin.2017.05.027. Accessed July 14, 2022.
12. Schofer J, Bijuklic K, Tiburtius C, Hansen L, Groothuis A, Hahn RT. First-in-human transcatheter tricuspid valve repair in a patient with severely regurgitant tricuspid valve. *J Am Coll Cardiol*. 2015 Mar 31;65(12):1190-1195. doi: 10.1016/j.jacc.2015.01.025.
13. Wagner R, Daehnert I, Lurz P. Percutaneous pulmonary and tricuspid valve implantations: An update. *World J Cardiol*. 2015 Apr 26;7(4):167-77. doi: 10.4330/wjcv.v7.i4.167. Accessed July 14, 2022.

APPENDIX

Reserved for State specific information. Information includes, but is not limited to, State contract language, Medicaid criteria and other mandated criteria.