Medtronic

Evolut™ TAVR

Performance that matters.

Think Evolut First.

Sustained valve performance helps keep your patients **alive** and **out of the hospital.**

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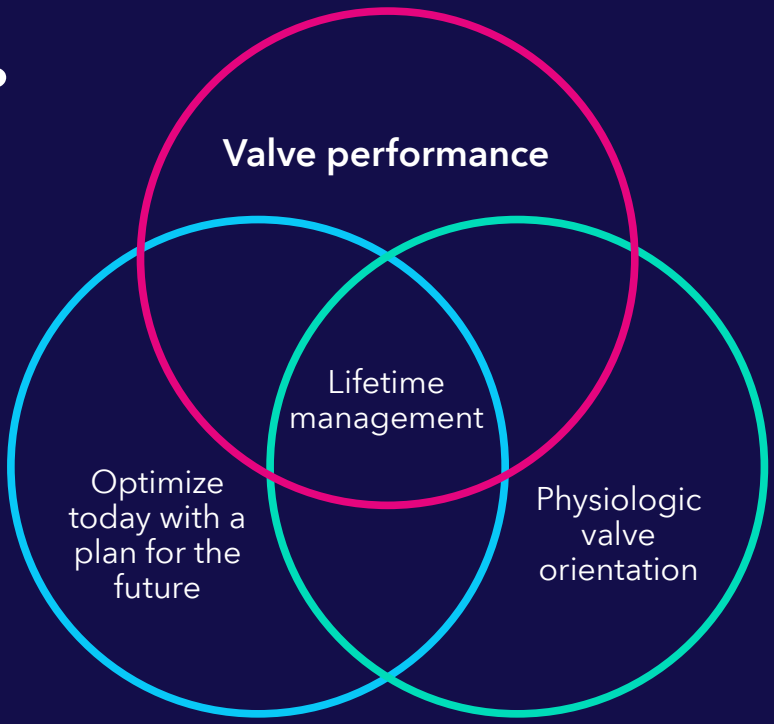
- Sustained valve performance is defined as stable low gradients, large effective orifice areas (EOAs), and the freedom from the four components of bioprosthetic valved dysfunction (BVD): structural valve deterioration (SVD), nonstructural valve deterioration (NSVD), thrombosis, and endocarditis.[1]
- Stable low gradients and freedom from SVD are critical to sustained valve performance, resulting in better survival and less heart failure (HF) rehospitalization.[2-5]

Valve performance starts the day of the procedure and **continues for a lifetime.**



Early performance markers predict late outcomes.

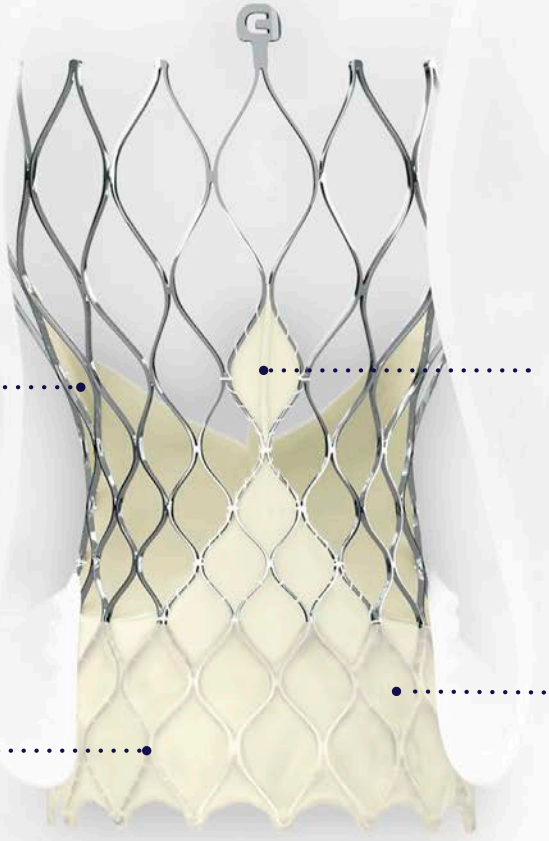
0–30 days	Low gradients/large EOA Freedom from: • Markers of BVD – Paravalvular leak (PVL) – Patient prosthesis mismatch (PPM)
30 days–1 year	Freedom from: • PVL • Thrombosis • Endocarditis
1–5 years	Freedom from: • SVD
> 5 years	Freedom from: • BVD/Bioprosthetic valve failure (BVF) • Valve reinterventions

Patients without severe PPM have a higher survival versus those with ≥ moderate PPM[6]

Only Evolut™ TAVR

has this **differentiated design.**

Built on the original CoreValve™ platform, Evolut TAVR is engineered with specific design elements to promote sustained valve performance with consistently large EOAs and low gradients over time.



Supra-annular mounting facilitates circularity and maximizes leaflet coaptation for lower gradients and reduced workload on the ventricle.[7]

Higher outward canted commissures distribute mechanical forces to reduce leaflet stress, provide a larger effective orifice area, and avoid PPM.[7]

Proprietary **nitinol frame** conforms to annulus for consistent radial force across wide, treatable annulus range.

External tissue wrap increases surface contact with native anatomy to reduce the risk of PVL.[8]

Medtronic has been continuously using **AOA** (alpha-amino oleic acid) as an anti-calcification treatment with surgical valves for more than 20 years and in TAVR valves for 10 years.

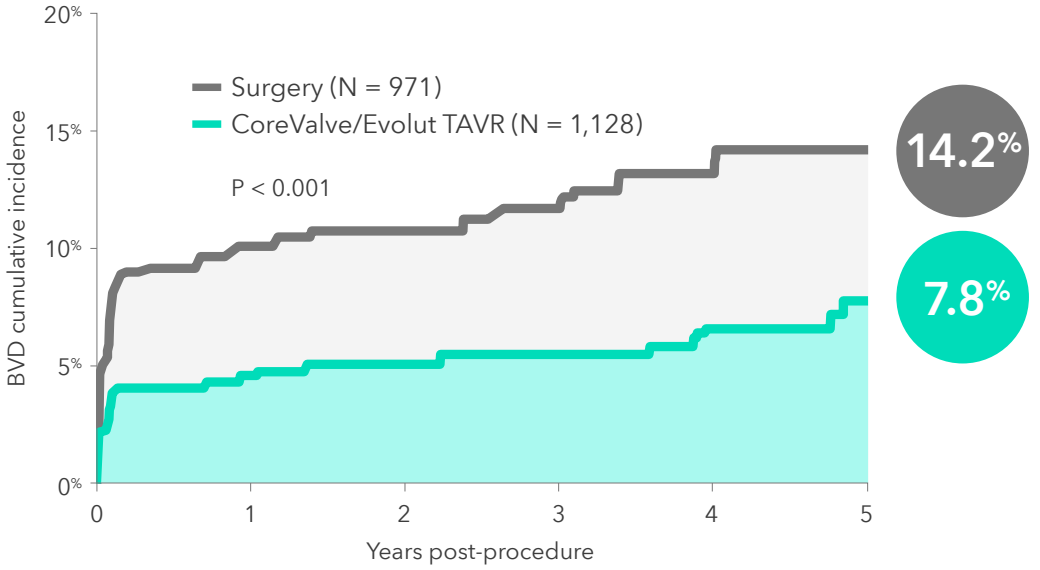
Only Evolut™ TAVR

provides **sustained valve performance.**

No other TAVR platform has shown better valve performance over SAVR in numerous multicenter, randomized clinical trials.

CoreValve™/Evolut™ TAVR is the first and only platform to demonstrate significantly better valve performance† versus SAVR at 5 years.‡[9]

Bioprosthetic valve dysfunction out to 5 years[9]



Devices used: 88% CoreValve/12% Evolut™ R.

Patients who **develop BVD** have worse outcomes[9]

1.5x
rate of death and rehospitalization in patients who developed BVD.[9]

†Bioprosthetic Valve Dysfunction (BVD) was defined as[9,10]: SVD[11] (mean gradient ≥ 10 mmHg increase from discharge/30 days AND ≥ 20 mmHg at last echo or new onset/increase of ≥ moderate intraprosthetic aortic regurgitation), NSVD (severe PPM at 30-day/discharge[1] or severe PVR through 5 years), clinical valve thrombosis, and endocarditis.

‡In pooled analysis of intermediate- and high-risk patients.

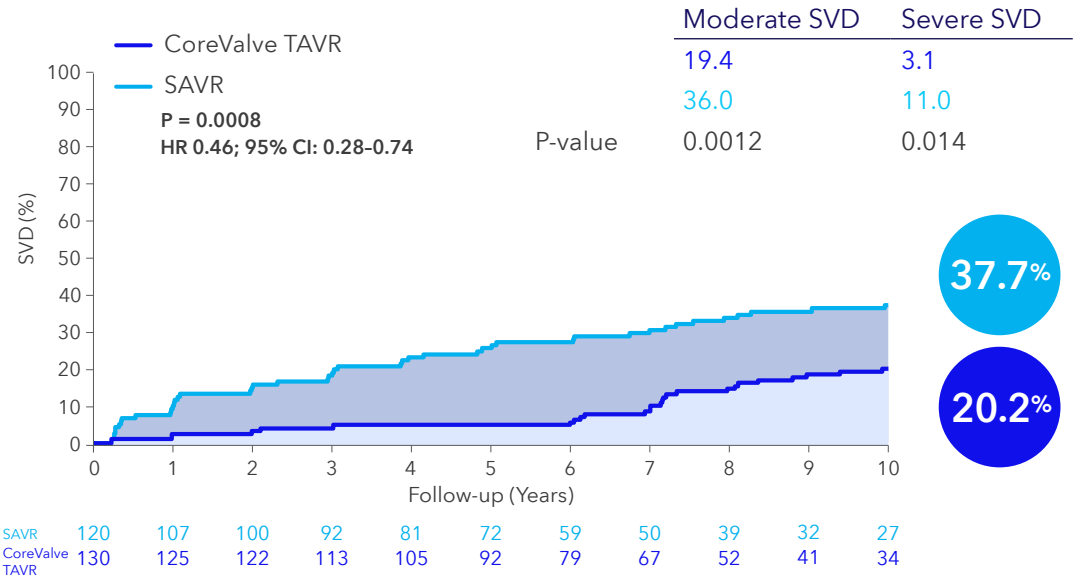
Only Evolut™ TAVR

delivers **a decade of durability.**

No other TAVR platform has ever shown a sustained durability benefit over SAVR in a multi-center, randomized clinical trial out to 10 years.[†12]

Statistically better structural valve deterioration (SVD) out to 10 years versus surgery.†

SVD out to 10 years



Statistically lower bioprosthetic valve dysfunction (BVD) versus SAVR at 10 years.‡

Devices used: CoreValve™ 100%.

† In patients at lower surgical risk over the age of 70.

‡ Bioprosthetic Valve Dysfunction (BVD)[10] was defined as: moderate or severe hemodynamic SVD (Mean gradient ≥ 20 mmHg or Mean gradient ≥ 10 mmHg change from index discharge or moderate/severe intra-prosthetic aortic regurgitation), NSVD (moderate to severe patient-prosthesis mismatch or more than mild paravalvular leak), clinical valve thrombosis, and endocarditis.

Only Evolut™ TAVR

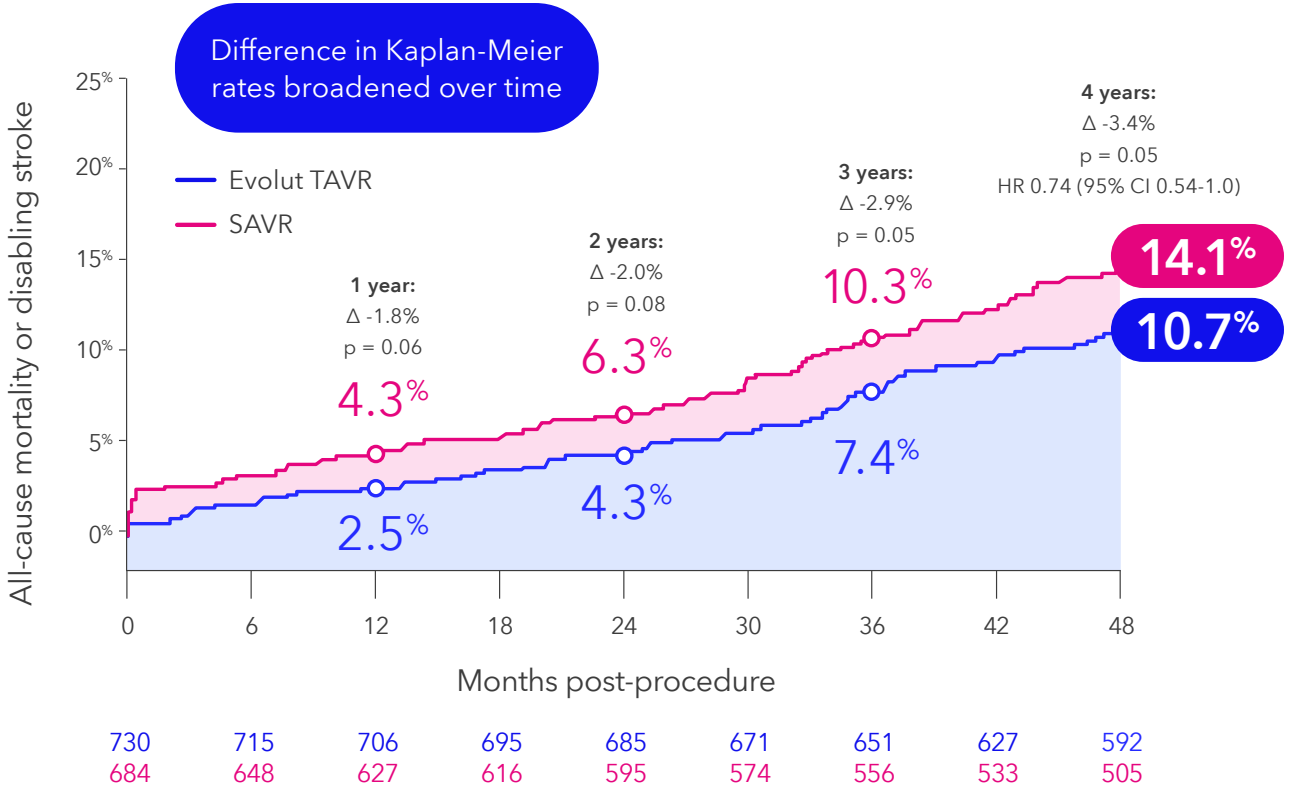
outperforms **SAVR in low-risk patients.**[13]

No other TAVR platform has shown numerically lower rates of death or disabling stroke versus state-of-the-art surgery that are diverging each year to 4 years.[13]

Learn more about trial design differences.

Evolut TAVR shows outstanding outcomes in low risk patients over time.

Primary Endpoint: All-cause Mortality or Disabling Stroke



Devices used: Evolut™ R 73% / Evolut™ PRO 23.4% / CoreValve™ 3.6%.

Reduction in hazard for death or disabling stroke at 4 years[13]

26%

The evidence points to **Evolut™ TAVR.**

Only Evolut™ TAVR

provides sustained:

- **Performance** – Significantly lower rates of SVD versus SAVR, which result in lower death and hospitalization for AV or HF at five years.[5]
- **Outcomes** – Numerically lower rates of death or disabling stroke versus state-of-the-art surgery that are diverging each year to four years.[13]
- **Durability** – Better hemodynamics out to 5 years[5] and better durability over SAVR at all time points tested up to 10 years.[12]

Think Evolut™ First

References

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[2] Playford D, Stewart S, Celermajer D, et al. Poor Survival with Impaired Valvular Hemodynamics After Aortic Valve Replacement: The National Echo Database Australia Study. *J Am Soc Echocardiogr.* September 2020;33(9):1077–1086.e1.

[3] Herrmann HC, Daneshvar SA, Fonarow GC, et al. Prosthesis-Patient Mismatch in Patients Undergoing Transcatheter Aortic Valve Replacement: From the STS/ACC TVT Registry. *J Am Coll Cardiol.* December 4, 2018;72(22):2701–2711.

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[8] Medtronic data on file. 90-day porcine GLP Evolut R study. Results may not be indicative of clinical performance.

[9] Yakubov S, et al. Five-Year Incidence of Bioprosthetic Valve Dysfunction in Patients Randomized to Surgery or TAVR: Insights From the CoreValve US Pivotal and SURTAVI Trials. Presented at CRT; February 2023.

[10] Capodanno D, Petronio AS, Prendergast B, et al. Standardized definitions of structural deterioration and valve failure in assessing long-term durability of transcatheter and surgical aortic bioprosthetic valves: a consensus statement from the European Association of Percutaneous Cardiovascular Interventions (EAPCI) endorsed by the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. December 1, 2017;38(45):3382-3390.

[11] Adapted from VARC-3 Writing Committee, et al. and Capodanno D, et al.

[12] Jørgensen T. Ten-year follow-up after transcatheter or surgical aortic valve implantation in severe aortic valve stenosis. Presented at ESC Congress; August 2023.

[13] Forrest JK, Deeb GM, Yakubov SJ, et al. 4-Year Outcomes of Patients With Aortic Stenosis in the Evolut Low Risk Trial. *JACC*. October 24, 2023;S0735–1097(23):07628–07633.

Indications
The Medtronic CoreValve™ Evolut™ R, Evolut™ PRO+, and Evolut™ FX Systems are indicated for relief of aortic stenosis in patients with symptomatic heart disease due to severe native calcific aortic stenosis who are judged by a heart team, including a cardiac surgeon, to be appropriate for the transcatheter heart valve replacement therapy.

The Medtronic CoreValve Evolut R, Evolut PRO+, and Evolut FX Systems are indicated for use in patients with symptomatic heart disease due to failure (stenosed, insufficient, or combined) of a surgical bioprosthetic aortic valve who are judged by a heart team, including a cardiac surgeon, to be at high or greater risk for open surgical therapy (e.g., STS predicted risk of operative mortality score ≥ 8% or at a ≥ 15% risk of mortality at 30 days).

Contraindications
The CoreValve Evolut R, Evolut PRO+, and Evolut FX Systems are contraindicated in patients who cannot tolerate Nitinol (titanium or nickel), gold (for Evolut FX Systems alone), an anticoagulation/antiplatelet regimen, or who have active bacterial endocarditis or other active infections.

Warnings
General Implantation of the CoreValve Evolut R, Evolut PRO+, and Evolut FX Systems should be performed only by physicians who have received Medtronic CoreValve Evolut R, Evolut PRO+, or Evolut FX training. This procedure should only be performed where emergency aortic valve surgery can be performed promptly. Mechanical failure of the delivery catheter system and/or accessories may result in patient complications. *Transcatheter aortic valve (bioprosthesis)* Accelerated deterioration due to calcific degeneration of the bioprostheses may occur in: children, adolescents, or young adults; patients with altered calcium metabolism (e.g., chronic renal failure or hyperthyroidism).

Precautions
General Clinical long-term durability has not been established for the bioprosthesis. Evaluate bioprosthesis performance as needed during patient follow-up. The safety and effectiveness of the CoreValve Evolut R, Evolut PRO+, and Evolut FX Systems have not been evaluated in the pediatric population. The safety and effectiveness of the bioprostheses for aortic valve replacement have not been evaluated in the following patient populations: Patients who do not meet the criteria for symptomatic severe native aortic stenosis as defined: (1) symptomatic severe high-gradient aortic stenosis – aortic valve area ≤ 1.0 cm^2 or aortic valve area index ≤ 0.6 cm^2/m^2, a mean aortic valve gradient ≥ 40 mm Hg, or a peak aortic-jet velocity ≥ 4.0 m/s; (2) symptomatic severe low-flow, low-gradient aortic stenosis – aortic valve area ≤ 1.0 cm^2 or aortic valve area index ≤ 0.6 cm^2/m^2, a mean aortic valve gradient < 40 mm Hg, and a peak aortic-jet velocity < 4.0 m/s; with untreated, clinically significant coronary artery disease requiring revascularization; with a preexisting prosthetic heart valve with a rigid support structure in either the mitral or pulmonic position if either the preexisting prosthetic heart valve could affect the implantation or function of the bioprosthesis or the implantation of the bioprosthesis could affect the function of the preexisting prosthetic heart valve; patients with liver failure (Child-Pugh Class C); with cardiogenic shock manifested by low cardiac output, vasopressor dependence, or mechanical hemodynamic support; patients who are pregnant or breastfeeding. The safety and effectiveness of a CoreValve Evolut R, Evolut PRO+, or Evolut FX bioprosthesis implanted within a failed preexisting transcatheter bioprosthesis have not been demonstrated. Implanting a CoreValve Evolut R, Evolut PRO+, or Evolut FX bioprosthesis in a degenerated surgical bioprosthetic valve (transcatheter aortic valve in surgical aortic valve [TAV-in-SAV]) should be avoided in the following conditions: The degenerated surgical bioprosthetic valve presents with: a significant concomitant paravalvular leak (between the prosthesis and the native annulus), is not securely fixed in the native annulus, or is not structurally intact (e.g., wire form frame fracture); partially detached leaflet that in the aortic position may obstruct a coronary ostium; stent frame with a manufacturer-labeled inner diameter < 17 mm. The safety and effectiveness of the bioprostheses for aortic valve replacement have not been evaluated in patient populations presenting with the following: Blood dyscrasias as defined as leukopenia (WBC < 1,000 cells/mm^3), thrombocytopenia (platelet count < 50,000 cells/mm^3), history of bleeding diathesis or coagulopathy, or hypercoagulable states; congenital unicuspid valve; mixed aortic valve disease (aortic stenosis and aortic regurgitation with predominant aortic regurgitation [3-4+]); moderate to severe (3-4+) or severe (4+) mitral or severe (4+) tricuspid regurgitation; hypertrophic obstructive cardiomyopathy; new or untreated echocardiographic evidence of intracardiac mass, thrombus, or vegetation; native aortic annulus size < 18 mm or > 30 mm per the baseline diagnostic imaging or surgical bioprosthetic aortic annulus size < 17 mm or > 30 mm; transarterial access unable to accommodate an 18 Fr introducer sheath or the 14 Fr equivalent EnVeo InLine™ Sheath when using models ENVEOR-US/D-EVPROP2329US or Evolut FX Delivery Catheter System with InLine™ Sheath when using model D-EVOLUTFX-2329 or transarterial access unable to accommodate a 20 Fr introducer sheath or the 16 Fr equivalent EnVeo InLine Sheath when using model ENVEOR-N-US or transarterial access unable to accommodate a 22 Fr introducer sheath or the 18 Fr equivalent Evolut PRO+ InLine Sheath when using model D-EVPROP34US or Evolut FX Delivery Catheter System with InLine Sheath when using model D-EVOLUTFX-34; prohibitive left ventricular outflow tract calcification; sinus of Valsalva anatomy that would prevent adequate coronary perfusion; significant aortopathy requiring ascending aortic replacement; moderate to severe mitral stenosis; severe ventricular dysfunction with left ventricular ejection fraction (LVEF) < 20%; symptomatic carotid or vertebral artery disease; and severe basal septal hypertrophy with an outflow gradient.

Before Use Exposure to glutaraldehyde may cause irritation of the skin, eyes, nose, and throat. Avoid prolonged or repeated exposure to the vapors. Damage may result from forceful handling of the catheter. Prevent kinking of the catheter when removing it from the packaging. The bioprosthesis size must be appropriate to fit the patient's anatomy. Proper sizing of the devices is the responsibility of the physician. Refer to the Instructions for Use for available sizes. Failure to implant a device within the sizing matrix could lead to adverse effects such as those listed below. Patients must present with transarterial access vessel diameters of ≥ 5 mm when using models ENVEOR-US/D-EVPROP2329US/D-EVOLUTFX-2329 or ≥ 5.5 mm when using model ENVEOR-N-US or ≥ 6 mm when using models D-EVPROP34US/D-EVOLUTFX-34, or patients must present with an ascending aortic (direct aortic) access site ≥ 60 mm from the basal plane for both systems. Implantation of the bioprosthesis should be avoided in patients with aortic root angulation (angle between plane of aortic valve annulus and horizontal plane/vertebrae) of > 30° for right subclavian/axillary access or > 70° for femoral and left subclavian/axillary access. For subclavian access, patients with a patent left internal mammary artery (LIMA) graft must present with access vessel diameters that are either ≥ 5.5 mm when using models ENVEOR-L-US/D-EVPROP2329US/D-EVOLUTFX-2329 or ≥ 6 mm when using model ENVEOR-N-US or ≥ 6.5 mm when using models D-EVPROP34US/D-EVOLUTFX-34. Use caution when using the subclavian/axillary approach in patients with a patent LIMA graft or patent RIMA graft. For direct aortic access, ensure the access site and trajectory are free of patent RIMA or a preexisting patent RIMA graft. For transfemoral access, use caution in patients who present with multiplanar curvature of the aorta, acute angulation of the aortic arch, an ascending aortic aneurysm, or severe calcification in the aorta and/or vasculature. If ≥ 2 of these factors are present, consider an alternative access route to prevent vascular complications. Limited clinical data are available for transcatheter aortic valve replacement in patients with a congenital bicuspid aortic valve who are deemed to be at low surgical risk. Anatomical characteristics should be considered when using the valve in this population. In addition, patient age should be considered as long-term durability of the valve has not been established.

During Use If a misload is detected during fluoroscopic inspection, do not attempt to reload the bioprosthesis. Discard the entire system. Inflow crown overlap that has not ended before the 4th node within the capsule increases the risk of an infold upon deployment in constrained anatomies, particularly with moderate-severe levels of calcification and/or bicuspid condition. Do not attempt to direct load the valve. After the procedure, administer appropriate antibiotic prophylaxis as needed for patients at risk for prosthetic valve infection and endocarditis. After the procedure, administer anticoagulation and/or antiplatelet therapy per physician/clinical judgment. Excessive contrast media may cause renal failure. Prior to the procedure, measure the patient's creatinine level. During the procedure, monitor contrast media usage. Conduct the procedure under fluoroscopy. Fluoroscopic procedures are associated with the risk of radiation damage to the skin, which may be painful, disfiguring, and long-term. The safety and efficacy of a CoreValve Evolut R, Evolut PRO+, or Evolut FX bioprosthesis implanted within a transcatheter bioprosthesis have not been demonstrated.

Potential adverse events
Potential risks associated with the implantation of the CoreValve Evolut R, Evolut PRO+, or Evolut FX transcatheter aortic valve may include, but are not limited to, the following: • death • myocardial infarction, cardiac arrest, cardiogenic shock, or cardiac tamponade • coronary occlusion, obstruction, or vessel spasm (including acute coronary closure) • cardiovascular injury (including rupture, perforation, tissue erosion, or dissection of vessels, ascending aorta trauma, ventricle, myocardium, or valvular structures that may require intervention) • emergent surgical or transcatheter intervention (e.g., coronary artery bypass, heart valve replacement, valve explant, percutaneous coronary intervention [PCI], balloon valvuloplasty) • prosthetic valve dysfunction (regurgitation or stenosis) due to fracture; bending (out-of-round configuration) of the valve frame; underexpansion of the valve frame; calcification; pannus; leaflet wear, tear, prolapse, or retraction; poor valve coaptation; suture breaks or disruption; leaks; mal-sizing (prosthesis-patient mismatch); malposition (either too high or too low)/malplacement • prosthetic valve migration/embolization • prosthetic valve endocarditis • prosthetic valve thrombosis • delivery catheter system malfunction resulting in the need for additional recrossing of the aortic valve and prolonged procedural time • delivery catheter system component migration/embolization • stroke (ischemic or hemorrhagic), transient ischemic attack (TIA), or other neurological deficits • individual organ (e.g., cardiac, respiratory, renal [including acute kidney failure]) or multi-organ insufficiency or failure • major or minor bleeding that may require transfusion or intervention (including life-threatening or disabling bleeding) • vascular access-related complications (e.g., dissection, perforation, pain, bleeding, hematoma, pseudoaneurysm, irreversible nerve injury, compartment syndrome, arteriovenous fistula, or stenosis) • mitral valve regurgitation or injury • conduction system disturbances (e.g., atrioventricular node block, left bundle-branch block, asystole), which may require a permanent pacemaker • infection (including septicemia) • hypotension or hypertension • hemolysis • peripheral ischemia • General surgical risks applicable to transcatheter aortic valve implantation: • bowel ischemia • abnormal lab values (including electrolyte imbalance) • allergic reaction to antiplatelet agents, contrast medium, or anesthesia • exposure to radiation through fluoroscopy and angiography • permanent disability.

Please reference the CoreValve Evolut R, Evolut PRO+, and Evolut FX Instructions for Use for more information regarding indications, warnings, precautions, and potential adverse events.

Caution: Federal Law (USA) restricts these devices to the sale by or on the order of a physician.

The commercial name of the Evolut™ R device is Medtronic CoreValve™ Evolut™ R System, the commercial name of the Evolut™ PRO+ device is Medtronic Evolut™ PRO+ System, and the commercial name of the Evolut™ FX device is Medtronic Evolut™ FX System.

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