

## MEDICAL COVERAGE POLICY

**SERVICE: Cardiac Monitoring - Outpatient**

**Policy Number: 065**

**Effective Date: 04/01/2023**

**Last Review: 02/23/2023**

**Next Review Date: 02/23/2024**

### Important note

Unless otherwise indicated, this policy will apply to all lines of business.

Even though this policy may indicate that a particular service or supply may be considered medically necessary and thus covered, this conclusion is not based upon the terms of your particular benefit plan. Each benefit plan contains its own specific provisions for coverage and exclusions. Not all benefits that are determined to be medically necessary will be covered benefits under the terms of your benefit plan. You need to consult the Evidence of Coverage (EOC) or Summary Plan Description (SPD) to determine if there are any exclusions or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and your plan of benefits, the provisions of your benefits plan will govern. However, applicable state mandates will take precedence with respect to fully insured plans and self-funded non-ERISA (e.g., government, school boards, church) plans. Unless otherwise specifically excluded, Federal mandates will apply to all plans. With respect to Medicare-linked plan members, this policy will apply unless there are Medicare policies that provide differing coverage rules, in which case Medicare coverage rules supersede guidelines in this policy. Medicare-linked plan policies will only apply to benefits paid for under Medicare rules, and not to any other health benefit plan benefits. CMS's Coverage Issues Manual can be found on the CMS website. Similarly, for Medicaid-linked plans, the Texas Medicaid Provider Procedures Manual (TMPPM) supersedes coverage guidelines in this policy where applicable.

**SERVICE:** Cardiac Monitoring - Outpatient (Mobile Outpatient Cardiac Monitoring and Ziopatch®)

**PRIOR AUTHORIZATION:** Not required.

### POLICY:

**For Medicare plans,** please refer to appropriate Medicare NCD (National Coverage Determination) or LCD (Local Coverage Determination). If there is no applicable NCD or LCD, use the criteria set forth below.

**For Medicaid plans,** please confirm coverage as outlined in the Texas Medicaid TMPPM.

BSWHP considers external intermittent cardiac event monitors (i.e., external loop recorders) medically necessary for **ANY** of the following conditions:

1. To document a dysrhythmia instead of using a Holter monitor or if a Holter monitor fails to document a suspected dysrhythmia; OR
2. To document the benefit after initiating drug therapy for a dysrhythmia; OR
3. To document the recurrence of a dysrhythmia after discontinuation of drug therapy; OR
4. To document the results after an ablation procedure for dysrhythmia; OR
5. To evaluate syncope, palpitations and lightheadedness that are thought to be secondary to a cardiac dysrhythmia, AND all other methods have failed to illuminate the etiology.

External loop recorders are considered experimental and investigational for all other indications.

SWHP considers mobile cardiovascular telemetry (MCT) (e.g., Ziopatch®, CardioNet Mobile Cardiac Outpatient Telemetry (MCOT) Service; Cardiac Telecom and Health Monitoring Services of America's Telemetry @ Home Service, etc.) medically necessary for evaluation of recurrent unexplained episodes of pre-syncope, syncope, palpitations, or dizziness when **ALL** of the following criteria are met:

1. A cardiac dysrhythmia is suspected as the cause of the symptoms; **AND**
2. Members have a non-diagnostic Holter monitor, or symptoms occur infrequently (less frequently than daily) such that the dysrhythmia is unlikely to be diagnosed by short term monitoring; **AND**
3. All other methods have failed to illuminate the etiology.

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Or for atrial fibrillation evaluation: Prolonged monitoring is required specifically to ensure the absence of atrial fibrillation prior to the discontinuation of anticoagulation therapy.

SWHP considers an implantable loop recorder (e.g., Reveal Insertable Loop Recorder by Medtronic, Inc.) medically necessary for evaluation of recurrent unexplained episodes of pre-syncope, syncope, palpitations, or dizziness when **ALL** of the following criteria are met:

1. A cardiac dysrhythmia is suspected as the cause of the symptoms; **AND**
2. Non-invasive ambulatory monitoring, consisting of either MCT or two 30-day external loop recordings, fails to establish a definitive diagnosis because the symptoms occur so infrequently and unpredictably that the monitoring period may not have been long enough to capture a diagnostic ECG; **AND**
3. All other methods have failed to illuminate the etiology.

Implantable loop recorders are considered experimental and investigational for all other indications.

BSWHP considers the following experimental and investigational because their clinical value has not been established:

- Biotronik BioMonitor
- Kardia Mobile (previously known as AliveCore Mobile ECG, AliveCor Heart Monitor (iPhoneECG))
- Mobile patient management systems (e.g., BodyGuardian Remote Monitoring System, and iHEART)
- Self-monitoring ECG technologies or the ViSi Mobile Monitoring System
- CardioPatch

### **Invasive Congestive Heart Failure Monitoring:**

BSWHP may consider the Cardiomems™ implantable congestive heart failure monitor medically necessary when the following criteria are met:

- Diagnosis of New York Heart Association (NYHA) Class III heart failure (HF) symptoms persistent despite maximally tolerated medical and device therapies; **AND**
- At least one HF related hospitalization within the previous 12 months; **AND**
- Able to take dual antiplatelet or anticoagulants for one month post-implant; **AND**
- Greater than or equal to 18 years of age; **AND**
- Member has diagnosis of HF for at least three months, with either preserved or reduced left ventricular ejection fraction; **AND**
- PA branch diameter sized between 7 and 15 mm; **AND**
- Body mass index (BMI) of  $\leq 35$ ; or  
if BMI  $> 35$ , a measurement of chest circumference at axillary level is required. If the chest circumference is greater than 165 cm, the sensor should not be implanted due to poor signal strength.

Monitoring must occur at least once weekly.

BSWHP considers all other implantable congestive heart failure monitors (e.g., the Chronicle IHM System, HF System, HeartPOD™ System, Promote® LAP System) experimental and

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investigational and unproven because such devices have not been shown to improve clinical outcomes compared to standard methods of heart failure monitoring.

### Self-contained Pacemaker Monitors:

SWHP considers self-contained pacemaker monitors medically necessary for members with cardiac pacemakers. These include the following types:

1. Audible/visible signal pacemaker monitors -- these devices produce an audible and visible signal that indicates the pacemaker rate.
2. Digital electronic pacemaker monitors -- these devices provide the member with an instantaneous digital readout of his/her pacemaker pulse rate.

A specialized telephone attachment for trans-telephonic transmission of pacemaker monitoring results is also considered medically necessary. The Pace Trac is an example of a pacemaker monitor currently on the market.

### Pulse Tachometers:

SWHP considers Pulse tachometers (pulse rate monitors, heart rate monitors) as not meeting SWHP's definition of covered durable medical equipment in that they are not primarily medical in nature and are normally of use in the absence of illness or injury. Examples of brand names of pulse tachometers include the Exersentry, the Insta-Pulse, and the MacLevy Omni Pulse. These are not covered services.

### Blood Pressure Monitors and Stethoscopes:

Home blood pressure monitors (sphygmomanometers, blood pressure cuffs) and stethoscopes do not meet SWHP's definition of covered durable medical equipment in that they may be of use in the absence of illness and injury. Following Medicare rules, SWHP covers blood pressure monitors and stethoscopes only for members receiving hemodialysis or peritoneal dialysis in the home.

SWHP considers automated oscillometer blood pressure (BP) monitors (e.g., Dinamap, Omron, and the BpTRU) for home use experimental and investigational because they have not been demonstrated to provide better health outcomes than conventional BP monitors (see overview).

**OVERVIEW:** Cardiac event monitors are small portable devices worn by a patient during normal activity for up to 30 days. The device has a recording system capable of storing several minutes of the individual's electrocardiogram (EKG) record. The patient can initiate EKG recording during a symptomatic period of dysrhythmia. These monitors are particularly useful in obtaining a record of dysrhythmia that would not be discovered on a routine EKG or a dysrhythmia that is so infrequent that it is not detected during a 24-hour period by a Holter monitor.

Mobile cardiovascular telemetry (MCT) refers to noninvasive ambulatory cardiac event monitors with extended memory capable of continuous measurement of heart rate and rhythm over several days, with transmission of results to a remote monitoring center. MCT is similar to standard cardiac telemetry used in the hospital setting.

A systematic evidence review of remote cardiac monitoring prepared for the Agency for Healthcare Research and Quality by the ECRI Evidence-based Practice Center (**AHRQ, 2007**) reached the following conclusions about the evidence for MCT: "This study [by Rothman, et al., 2007] was a high-

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quality multicenter study with few limitations. Therefore, the evidence is sufficient to conclude that real-time continuous attended monitoring leads to change in disease management in significantly more patients than do certain ELRs [external loop recorders]. However, because this is a single multicenter study, the strength of evidence supporting this conclusion is weak. Also, the conclusion may not be applicable to ELRs with automatic event activation, as this model was underrepresented in the RCT [by Rothman, et al., 2007] (only 16% of patients used this model)."

### **Congestive Heart Failure Telemonitoring:**

Non-invasive telemonitoring for congestive heart failure involves the trans-telephonic transmission of weight, blood pressure (BP), heart rate and rhythm to a remote monitoring center. The Trans-European Network-Home-Care Management System (TEN-HMS) study is a randomized controlled clinical trial comparing home telemonitoring (HTM) to nurse telephone support (NTS) and usual care (UC) for patients with heart failure who are at high risk of hospitalization or death. The study found that patients assigned to HTM did not have significantly better outcomes than patients assigned to NTS or UC.

Heart failure guidelines from the National Institute for Clinical Excellence (2003) stated that "[m]ore complex remote monitoring (such as telemonitoring) of patients with heart failure is in its infancy, but shows promise for the future."

### **Invasive Congestive Heart Failure Monitoring:**

The CardioMEMS implantable hemodynamic monitor (CM-IHM) system utilizes an implantable pulmonary artery pressure (PAP) sensor to allow patients to measure PAP remotely from home. Since elevated PAP is often an early indication of an impending HF exacerbation, data from CM-IHM can alert the patient and physician so that decisions regarding treatment can be made. Patients are instructed to obtain daily PAP readings, which are automatically uploaded to a database that can be accessed by the patient and caregivers. Physicians incorporate the PAP data into the HF treatment plan, often resulting in data-based dose changes to guideline-directed medical therapy.

In a meta-analysis evaluating CardioMEMS implantable hemodynamic monitor for management of HF (Thakker et al. (2021)), the authors concluded that pts with CM-IHM had reduced likelihood of hospitalizations compared with pts without CM-IHM. The authors also concluded that remote PAP monitoring is even more valuable during a pandemic like COVID-19.

National Institute for Health and Care Excellence (NICE) released a 2021 interventional procedures guidance evaluating the safety and efficacy of percutaneously implanted PAP sensors for monitoring heart failure (HF). Based on data from 9 studies, the NICE found that the evidence base is adequate to support the use of percutaneously implanted PAP sensors for managing chronic HF

European Society of Cardiology (ESC) published in 2021 a guideline focused on making evidence-based recommendations specific to the diagnosis and treatment of HF. The ESC working group determined that PAP monitoring with a wireless system (e.g., CM-IHM) may be considered to improve clinical outcomes in patients with symptomatic HF (strength, IIb; level of evidence, B) (McDonagh et al., 2021).



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### Home Blood Pressure Monitoring (HBPM)

USPSTF recommends screening for hypertension in adults. USPSTF recommends use of home blood pressure monitoring for management of hypertension. Data from quality studies suggest that elevated blood pressure readings from HBPM were associated with increased cardiovascular outcomes. Per USPSTF, HBPM is also recommended to confirm hypertension when ambulatory blood pressure monitoring is not feasible.

### Automated Oscillometer Blood Pressure Monitors:

Multiple clinical studies reveal weaknesses of these monitors in specific populations and are not supportive of widespread use, favoring more standardized blood pressure measurements by trained professionals.

**MANDATES:** There are no mandated benefits or regulatory requirements for SWHP to provide coverage for these services.

### CODES:

#### Important note:

*CODES: Due to the wide range of applicable diagnosis codes and potential changes to codes, an inclusive list may not be presented, but the following codes may apply. Inclusion of a code in this section does not guarantee that it will be reimbursed, and patient must meet the criteria set forth in the policy language.*

CPT Codes:	<p>33289 - Transcatheter implantation of wireless pulmonary artery pressure sensor for long-term hemodynamic monitoring</p> <p>93264 - Remote monitoring of a wireless pulmonary artery pressure sensor for up to 30 days, 33282 implantation of cardiac event monitor</p> <p>33284 removal of implantable cardiac event monitor</p> <p>33285 Insertion, subcutaneous cardiac rhythm monitor, including programming</p> <p>33286 Removal, subcutaneous cardiac rhythm monitor</p> <p>93224 Ext recording up to 48h with interpretation</p> <p>93225 Ext recording up to 48h</p> <p>93226 Ext recording up to 48h with report</p> <p>93227 Ext recording up to 48h with report and interpretation</p> <p>93228 Ext remote cardiac telemetry up to 30 days</p> <p>93229 Ext remote cardiac telemetry up to 30 days with interpretation</p> <p>93241 External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation</p> <p>93242 External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; recording (includes connection and initial recording)</p> <p>93243 External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; scanning analysis with report</p> <p>93244 External electrocardiographic recording for more than 48 hours up to 7 days by continuous rhythm recording and storage; review and interpretation</p> <p>93245 External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; includes recording, scanning analysis with report, review and interpretation</p>
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	<p>93246 External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; recording (includes connection and initial recording)</p> <p>93247 External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; scanning analysis with report</p> <p>93248 External electrocardiographic recording for more than 7 days up to 15 days by continuous rhythm recording and storage; review and interpretation</p> <p>93264 - Remote monitoring of a wireless pulmonary artery pressure sensor for up to 30 days, 93268 Ext cardiac event monitoring with report and interpretation</p> <p>93270 Ext cardiac event monitoring</p> <p>93271 Ext cardiac event monitoring with analysis</p> <p>93272 Ext cardiac event monitoring with report and interpretation</p> <p>93285: Programming device evaluation with iterative adjustment of the implantable device to test the function of the device and select optional permanent programmed values with analysis, review and report by a physician or other qualified health care professional, implantable loop recorder system</p> <p>93291: Interrogation device evaluation with analysis, review and report by a physician or other qualified health care professional, includes connection, recording and disconnection per patient encounter, implantable loop recorder system, including heart rhythm derived data analysis</p> <p>93298: Interrogation device evaluation(s), up to 30 days, implantable loop recorder system, including analysis of recorded heart rhythm data, analysis, review(s) and report(s) by a physician or other qualified health care professional</p> <p>93299: Interrogation device evaluation(s), up to 30 days, implantable cardiovascular monitor system or implantable loop recorder system, remote data acquisition(s), receipt of transmission(s) and technician review, technical support and distribution of results</p>
CPT Not Covered:	
ICD10:	<p>G45.9 - TIA</p> <p>I25.82 - Complete Coronary Occlusion</p> <p>I44.0 - I49.9 - Arrhythmias</p> <p>R00.0 - R00.9 - Tachy/brady</p> <p>R42 - Giddiness and dizziness</p> <p>R55 - Syncope and Collapse</p> <p>Z86.73 - Z86.74 - TIA/Sudden cardiac arrest, resuscitated</p>
HCPCS Codes	<p>C1764 Implantable cardiac event recorder</p> <p>E0616 Implantable cardiac event monitor with memory, etc.</p> <p>C2624 Implantable wireless pulmonary artery pressure sensor</p>

**CMS:** NCD 20.15 (NCD for Electrocardiographic Services; publication number 100-3)

LCD L34953/A56600 Cardiac Event Detection Monitoring

LCD L34997/A52996 Real-Time, Outpatient Cardiac Telemetry

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### POLICY HISTORY:

Status	Date	Action
New	12/17/2010	New policy
Reviewed	12/6/2011	Reviewed.
Reviewed	11/15/2012	Reviewed. References updated.
Reviewed	10/24/2013	ICD10 added, LCD updated, Ziopatch® included
Reviewed	08/21/2014	Title change. LCD information appended.
Reviewed	08/11/2015	No changes
Reviewed	09/08/2016	
Reviewed	08/08/2017	Codes updated
Reviewed	01/16/2018	Minor updates. Reviewed Cardiomems™ status.
Reviewed	01/08/2019	No significant changes
Reviewed	01/23/2020	No significant changes
Reviewed	01/28/2021	Code list updated. Specific excluded devices listed.
Reviewed	01/27/2022	Updated codes.
Reviewed	01/26/2023	Updated codes. Added reference to TAC regarding Cardiomems
Updated	02/23/2023	Added criteria for Cardiomems device

### REFERENCES:

The following scientific references were utilized in the formulation of this medical policy. BSWHP will continue to review clinical evidence related to this policy and may modify it at a later date based upon the evolution of the published clinical evidence. Should additional scientific studies become available and they are not included in the list, please forward the reference(s) to BSWHP so the information can be reviewed by the Medical Coverage Policy Committee (MCPC) and the Quality Improvement Committee (QIC) to determine if a modification of the policy is in order.

1. de Lusignan S, Wells S, Johnson P, et al. Compliance and effectiveness of 1 year's home telemonitoring. The report of a pilot study of patients with chronic heart failure. *Eur J Heart Fail.* 2001;3(6):723-730.
2. de Lusignan S, Meredith K, Wells S, et al. A controlled pilot study in the use of telemedicine in the community on the management of heart failure--a report of the first three months. *Stud Health Technol Inform.* 1999;64:126-137.
3. Cordisco ME, Benjaminovitz A, Hammond K, Mancini D. Use of telemonitoring to decrease the rate of hospitalization in patients with severe congestive heart failure. *Am J Cardiol.* 1999;84(7):860-862, A8.
4. Rose KM, Arnett DK, Ellison RC, Heiss G. Skip patterns in DINAMAP-measured blood pressure in 3 epidemiological studies. *Hypertension.* 2000;35(5):1032-1036.
5. Barker ME, Shiell AW, Law CM. Evaluation of the Dinamap 8100 and Omron M1 blood pressure monitors for use in children. *Paediatr Perinat Epidemiol.* 2000;14(2):179-186.
6. Beaubien ER, Card CM, Card SE, et al. Accuracy of the Dinamap 1846 XT automated blood pressure monitor. *J Hum Hypertens.* 2002;16(9):647-652.
7. Chang JJ, Rabinowitz D, Shea S. Sources of variability in blood pressure measurement using the Dinamap PRO 100 automated oscillometric device. *Am J Epidemiol.* 2003;158(12):1218-1226.
8. Textor SC, Taler SJ, Larson TS, Blood pressure evaluation among older living kidney donors. *J Am Soc Nephrol.* 2003;14(8):2159-2167.
9. Ramanathan A, Conaghan PJ, Jenkinson AD, Bishop CR. Comparison of ankle-brachial pressure index measurements using an automated oscillometric device with the standard Doppler ultrasound technique. *ANZ J Surg.* 2003;73(3):105-108.

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10. Afzali B, Haydar AA, Abbs IC, Goldsmith DJ. Measuring blood pressure in stable renal transplant recipients: What you measure depends on what you use. *Nephron Clin Pract.* 2004;97(3):c98-c102.
11. Dannevig I, Dale HC, Liestol K, Lindemann R. Blood pressure in the neonate: Three non-invasive oscillometric pressure monitors compared with invasively measured blood pressure. *Acta Paediatr.* 2005;94(2):191-196.
12. Hailey D, Ohinmaa A, Roine R. Evidence for the benefits of telecardiology applications: A systematic review. *Health Technology Assessment* 34. Edmonton, AB: Alberta Heritage Foundation for Medical Research (AHFMR); October 2004.
13. Cleland JG, Louis AA, Rigby AS, et al.; TEN-HMS Investigators. Noninvasive home telemonitoring for patients with heart failure at high risk of recurrent admission and death: The Trans-European Network-Home-Care Management System (TEN-HMS) study. *J Am Coll Cardiol.* 2005;45(10):1654-1664.
14. Richards M. Further studies are needed to assess the benefits of telemonitoring and telephone support for people with heart failure. *Commentary. Evid Based Cardiovasc Med.* 2005;9(4):322-325.
15. Chaudhry SI, Phillips CO, Stewart SS, et al. Telemonitoring for patients with chronic heart failure: A systematic review. *J Card Fail.* 2007;13(1):56-62.
16. Grancelli HO and Ferrante DC. Telephone interventions for disease management in heart failure. *BMJ.* 2007;334(7600):910-911.
17. Magalski, A, Adamson P, Gadler F, et al. Continuous ambulatory right heart pressure measurements with an implantable hemodynamic monitor: A multicenter, 12-month follow-up study of patients with chronic heart failure. *J Card Fail.* 2002;8:63-70.
18. Ohlsson, A, Kubo SH, Steinhaus D, et al. Continuous ambulatory monitoring of absolute right ventricular pressure and mixed venous oxygen saturation in patients with heart failure using an implantable haemodynamic monitor: Results of a 1 year multicenter feasibility study. *Eur Heart J.* 2001;22:942-954.
19. Ho C. Implantable hemodynamic monitoring (the Chronicle IHM system): Remote telemonitoring for patients with heart failure. *Issues Emerg Health Technol.* 2008; 111:1-4.
20. Bourge RC, Abraham WT, Adamson PB, et al.; COMPASS-HF Study Group. Randomized controlled trial of an implantable continuous hemodynamic monitor in patients with advanced heart failure: The COMPASS-HF study. *J Am Coll Cardiol.* 2008;51(11):1073-1079.
21. Teerlink JR. Learning the points of COMPASS-HF: Assessing implantable hemodynamic monitoring in heart failure patients. *J Am Coll Cardiol.* 2008;51(11):1080-1082.
22. Dang S, Dimmick S, Kelkar G. Evaluating the evidence base for the use of home telehealth remote monitoring in elderly with heart failure. *Telemed J E Health.* 2009;15(8):783-796.
23. Mortara A, Pinna GD, Johnson P, et al; HHH Investigators. Home telemonitoring in heart failure patients: The HHH study (Home or Hospital in Heart Failure). *Eur J Heart Fail.* 2009;11(3):312-318.
24. Schmidt S, Schuchert A, Krieg T, Oeff M. Home telemonitoring in patients with chronic heart failure: A chance to improve patient care? *Dtsch Arztebl Int.* 2010;107(8):131-138.
25. Polisen J, Tran K, Cimon K, et al. Home telemonitoring for congestive heart failure: A systematic review and meta-analysis. *J Telemed Telecare.* 2010;16(2):68-76.
26. Uhlig K, Balk EM, Patel K, et al. Self-Measure Blood Pressure Monitoring: Comparative Effectiveness. AHRQ Publication No. 12-EHC002-EF. Rockville, MD: Agency for Healthcare Research and Quality; 2012. PMID: 22439158.
27. High Blood Pressure in Adults. A Systematic Review for USPSTF, October 2015
28. Niranan TJ et al. Home-measured Blood Pressure is a Stronger predictor of cardiovascular risk than Office Blood Pressure Niranan TJ et al. Home-measured Blood Pressure is a Stronger predictor of cardiovascular risk than Office Blood Pressure: the Finn Home Study. *Hypertension.* 2010;55:1346-51
29. Ollendorf DA, Sandhu AT, Chapman R, et al.; Institute for Clinical and Economic Review (ICER). CardioMEMS™ HF System (St. Jude Medical) and Sacubitril/Valsartan (Entresto™, Novartis) for Management



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of Congestive Heart Failure: Effectiveness, Value, and Value-Based Price Benchmarks. Draft Report. San Francisco, CA: California Technology Assessment Forum (CTAF); September 11, 2015.

30. Maurer MS, Adamson PB, Costanzo MR, et al. Rationale and design of the left atrial pressure monitoring to optimize heart failure therapy study (LAPTOP-HF). J Card Fail. 2015;21(6):479-488.
31. Abraham WT. The role of implantable hemodynamic monitors to manage heart failure. Cardiol Clin. 2017;35(2):273-279.
32. Cowie MR, Flett A, Cowburn P, et al. Real-world evidence in a national health service: results of the UK CardioMEMS HF System Post-market Study. ESC Heart Fail. 2022;9(1):48-56. doi:10.1002/ehf2.13748
33. Kishino Y, Kuno T, Malik AH, et al. Effect of pulmonary artery pressure-guided therapy on heart failure readmission in a nationally representative cohort. ESC Heart Fail. 2022. doi:10.1002/ehf2.13956
34. NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE (NICE): Percutaneous implantation of pulmonary artery pressure sensors for monitoring treatment of chronic heart failure Interventional procedures guidance [IPG711]Published: 24 November 2021
35. Hayes, Inc. Technology Assessment. CardioMEMS Implantable Hemodynamic Monitor (Abbott) for Managing Patients With Heart Failure. Lansdale, PA. Hayes, Inc. 2023.
36. Thakker RA, Abu-Jazar D, Cabello R, et al. Outcomes in hospitalization in patients with heart failure undergoing remote pulmonary artery pressure monitoring: a systematic review and meta-analysis of major trials. Curr Probl Cardiol. Epub ahead of print. September 20, 2021:100980. doi:10.1016/j.cpcardiol.2021.100980
37. McDonagh TA, Metra M, Adamo M, et al. Erratum: 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2021;42(48):4901. doi:10.1093/eurheartj/ehab670
38. Heywood JT, et al. Sustained Reduction in Pulmonary Artery Pressures and Hospitalizations During 2 Years of Ambulatory Monitoring. J Cardiac Fail 2023;29:56-66.

**Note:** Health Maintenance Organization (HMO) products are offered through Scott and White Health Plan dba Baylor Scott & White Health Plan, and Scott & White Care Plans dba Baylor Scott & White Care Plan. Insured PPO and EPO products are offered through Baylor Scott & White Insurance Company. Scott and White Health Plan dba Baylor Scott & White Health Plan serves as a third-party administrator for self-funded employer-sponsored plans. Baylor Scott & White Care Plan and Baylor Scott & White Insurance Company are wholly owned subsidiaries of Scott and White Health Plan. These companies are referred to collectively in this document as Baylor Scott & White Health Plans.

RightCare STAR Medicaid plans are offered through Scott and White Health Plan in the Central Managed Care Service Area (MRSA) and STAR and CHIP plans are offered through SHA LLC dba FirstCare Health Plans (FirstCare) in the Lubbock and West MRSAs. Individual HMO plans are offered through FirstCare in West Texas.