



Working Draft: New Cardiac Rehabilitation Models in the US

October 20, 2020

Hospital/ Health System	Reimbursement Model	Asynchronous Vs Synchronous	Program Description	Additional Information and References	POC
Duke Health (Durham, NC)	Fee-for-service (monthly reimbursement for remote monitoring)	Asynchronous	Duke Health’s Mobile Cardiac Rehabilitation Program: Specialists at the Duke Health Cardiopulmonary Rehabilitation Center monitor patients’ progress using digital data captured from wearable devices and stored in a dashboard. At least once/week phone calls are used to provide feedback and guidance. A HIPAA-compliant process was developed with Pattern Health to retrieve and monitor these data. A 20-patient RCT pilot was completed in 2020.	<ul style="list-style-type: none"> - Remote Cardiac Rehabilitation Launched as COVID-19 Response - Duke Cardiopulmonary Rehabilitation at Croasdaile 	William E. Kraus, MD, Medical Director, Duke Health Cardiopulmonary Rehabilitation Center, Duke University Hospital
Henry Ford Health System (Detroit, MI)	Fee-for-service (reimbursement for CR sessions from BCBS Michigan and Health Alliance Plan of Michigan)	Synchronous	Henry Ford Health System’s Home-Based Cardiac Rehabilitation Program: Synchronous, telemedicine-based videoconferencing program that uses the free Henry Ford MyChart app and the patient’s smart phone or other suitable mobile device for live two-way videoconferencing to allow for supervised exercise at the patient’s home with narrated slide decks for patient education.	<ul style="list-style-type: none"> - Henry Ford Health System’s Home-Based Cardiac Rehabilitation Program website - Berry R, Brawner CA, Kipa SG, et al. Telemedicine Home-Based Cardiac Rehabilitation: A Case Series. J Cardiopulm Rehabil Prev. 2020; 40(4):245-248. 	Steven Keteyian, PhD, Director of Cardiac Rehabilitation/Preventive Cardiology Unit, Henry Ford Hospital

				- Improving Attendance to Cardiac Rehabilitation (IATTEND) Trial , NHLBI clinical trial	
Highmark Health (Pennsylvania, Delaware, and West Virginia) (pilot)	Capitated (regional health plan and health system of BCBS)	Asynchronous	VITAL Innovation Platform to Pilot MOVN: Pilot of the Moving Analytics , MOVN* system. ⁱ The pilot runs from November 2019 through April 2021.	- Press Release: Highmark Health’s VITAL Innovation Platform testing the benefits of Moving Analytics’ virtual cardiac rehabilitation program	Anil Singh, MD, MPH, VITAL Medical Advisor, Allegheny Health Network
Kaiser Permanente (Northern California)	Capitated	Asynchronous	Virtual Cardiac Rehabilitation: Implement the Moving Analytics , MOVN* system. ⁱ The patients are followed over 6 months with up to 12 nurse-initiated telephone calls, up to 4 outpatient visits with a nurse case manager, and computer-generated progress reports based on patients’ responses to questionnaires.	- Developed based on findings from DeBusk RF, Miller NH, Superko HR, et al. A case-management system for coronary risk factor modification after acute myocardial infarction. <i>Ann Intern Med.</i> 1994;120:721–729. PubMed .	Eleanor Levin, MD, Clinical Professor of Medicine, Stanford University Medical Center Chief Scientific Advisor, Moving Analytics Inc.
Kaiser Permanente (Northwest, Oregon and Southwest Washington)	Capitated	Asynchronous	Kaiser Permanente’s Virtual CR Program: Implement the Moving Analytics , MOVN* system. ⁱ The physical activity data is uploaded into the MOVN* app on their smartphone and these data are shared with the VCR team at Kaiser	- Oregon’s Only Virtual Cardiac Rehab Program Helps Patients Heal and Recover	Siobhan Gray, MD, Medical Director for Virtual Cardiac Rehabilitation at Kaiser Permanente’s Center for Heart and Vascular Care

			Permanente's Center for Heart and Vascular Care.		
Kaiser Permanente (Southern California, Georgia, and Hawaii)	Capitated	Asynchronous	<u>Kaiser Permanente's Home-Based Cardiac Rehabilitation Program:</u> Eligible post-acute myocardial infarction patients are onboarded in-person (when possible) to orient them to the program and loaned wearable devices made available in partnership with SAMSUNG. Data from the wearable device is automatically uploaded into the custom Kaiser app in the patient's smartphone. Data are submitted and monitored daily by clinicians via a dashboard. Clinical nurse managers call patients weekly to follow up on progress and assess issues with treatment plan. The patient's daily heart rate and activities are added to a patient's chart for clinicians and physical therapists to review. Concerning data is brought to the attention of the patient's cardiologist.	<ul style="list-style-type: none"> - Funahashi T, Borgo K, and Joshi N. Saving Lives with Virtual Cardiac Rehabilitation. NEJM Catalyst. 2019 - Home Based Cardiac Rehabilitation (HBCR) – A virtual program to improve members' lives, Kaiser Permanente 2020 National Quality Conference abstract 	Tadashi Funahashi, MD, Chief Innovation & Transformation Officer, Kaiser Permanente Southern California
Mayo Clinic (Rochester, MN)	Fee-for-service	Asynchronous	<u>Mayo's Home-Based Cardiac Rehabilitation Program:</u> 13-week home-based program led by Mayo Clinic cardiac rehabilitation staff. Patients have an enter consult over the phone to develop the Individualized Treatment Plan (ITP). 12 weekly calls with exercise physiologists to provide education and services. Patient questionnaires, Toronto's Cardiac College resources, and other resources are provided via Mayo's online messaging platform. Where possible, patients' heart rate, blood pressure, blood glucose, and weight are	<ul style="list-style-type: none"> - COVID-19 Response Case Study from Mayo Clinic Cardiac Rehab in Rochester (March 31, 2020 video) 	Randal J. Thomas, MD, Medical Director of Mayo Clinic's Cardiac Rehabilitation Program, Mayo Clinic

			reported over the phone calls or via the online messaging system. A final consultation is provided by the supervising physician or nurse practitioner.		
University of California, San Francisco (San Francisco, CA)	Fee-for-service	Synchronous and asynchronous	UCSF Hybrid and Home-based CR program: Hybrid (12 center sessions + supervised and unsupervised exercise) and home-based (2 center-based sessions + 10 weekly phone or video session + unsupervised exercise) programs are offered to patients according to their COVID-19 risk, CV event risk, transportation time, home/community exercise options, phone/video use proficiency, and preferences. Referrals to dietician, PharmD, and behavioral health are provided. Provider-led education is provided via phone/video visits and by sending readings/slides/videos through MyChart. Weekly peer support Zoom meetings. The minimum equipment for home-based CR includes a home BP cuff, scale, and glucometer (if Diabetes).	- UCSF Future State: UCSF Cardiac Rehabilitation slide deck	Alexis Beatty, MD, MAS, Associate Professor, Departments of Epidemiology & Biostatistics, Medicine
University of Michigan (Ann Arbor, MI)	Fee-for-service (reimbursement for CR sessions from BCBS Michigan and use modifiers to bill for non-covered interactive communication services)	Synchronous	Michigan Medicine Home-Based Cardiac Rehabilitation: 12-week hybrid program with 3 on-site visits the first week followed by 3-4 weeks of synchronous audio/visual virtual visits. Use wearables (when available) and a home blood pressure monitor to monitor vitals. Return on-site on week 6 or 7. Assess improvements in vitals and proceed with 4-5 weeks of virtual visits. The final week the patient returns on-site for a final assessment.	- Cardiac Rehabilitation: Home-Based Cardiac Rehabilitation During COVID-19 - Cardiac Rehab at Home Helps Patient During COVID-19 Pandemic (May 2020 Heart Health online article)	Melvyn Rubenfire, MD, Medical Director at University of Michigan's Cardiovascular Medicine

University of North Carolina (UNC) (pilot)	Grant-funded clinical trial	Synchronous and asynchronous	HeartHome: A nurse-driven home-based CR program adapted from MULTIFIT for acute MI patients. Includes nurse home visits with telephone and electronic supports with a 12-week educational program. The program’s impact will be evaluated on patient outcomes over 6 months; and compare outcomes of HeartHome participants to a group of participants in traditional CR	- HeartHome: A Nurse-Driven, Home-Based Cardiac Rehabilitation Program , Duke Endowment trial	Cheryl Jones, RN, PhD, Director, Hillman Scholars Program in Nursing Innovation Systems/Policy/ Informatics, University of North Carolina
University of Pittsburgh Medical Center (Pittsburgh, PA)	Fee-for-service	Synchronous and asynchronous	MACRO: Hybrid program that expands the patient-centered premise of CR with added tools to better assess and respond to idiosyncrasies of age that predictably align with CVD risk. Includes site-based, home-based, and other versions of standard of care for CR.	- Modified Application of Cardiac Rehabilitation for Older Adults (MACRO) , NIA clinical trial	Daniel Forman, MD, Professor of Medicine, University of Pittsburgh Medical Center and Pittsburgh VA
Veterans Affairs (VA) (see locations in endnote) ⁱⁱ	Capitated	Synchronous and asynchronous	VA Home Based CR Programs: Veterans receive weekly individualized appointments for 12 weeks from a cardiac rehabilitation provider and are counseled on exercise, nutrition, stress management, medication adherence, tobacco cessation, and risk factor management. Weekly appointments are provided through video and/or telephone calls. Patients are provided with minimal equipment of pedal exerciser, pedometer, TheraBand, blood pressure monitor, and educational workbook. Program operations may differ from site to site and can include additional technology such as additional VA apps, telehealth monitoring, or the MOVN system.	- Rural Promising Practices - Feasibility and Effectiveness of Remote, Telephone-Based Delivery of Cardiac Rehabilitation (Iowa City, IA) - Creating and disseminating a home-based cardiac rehabilitation program: experience from the Veterans Health Administration - Cardiac Rehabilitation	Kariann Drwal, Office of Rural Health, Veteran Affairs

*MOVN is Moving Analytics’ app-based program adapted from Stanford’s MULTIFIT model.

				During COVID-19 Pandemic: Highlighting the Value of Home-Based Programs - Effectiveness of a Home Based Cardiac Rehabilitation Program in Veterans	
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ⁱ MOVN* nurse-based care managers enroll referred patients, develop a personalized treatment plan, provide care kit with the app, and (if necessary) connected devices. Patient uses the app to follow the curriculum, report vitals and symptoms, and use reminders for behavior modification. Weekly coaching sessions are used to provide education, emotional support and counselling on risk factors. Medical Directors approve treatment plans, provide oversight, and are consulted if patient issues arise.

ⁱⁱ VA locations offering home-based CR programs: Ann Arbor, MI; Asheville, NC; Atlanta, GA; Battle Creek, MI; Boston, MA; Buffalo (Syracuse), NY; Charleston, SC; Cincinnati, OH; Cleveland, OH; Columbia, SC; Dayton, OH; Durham, NC; Gainesville, FL; Houston, TX; Iowa City (St. Cloud), IA; Little Rock, AR; Los Angeles, CA; Madison, WI; Marion, IL; Montana; Palo Alto, CA; Phoenix, AZ; Pittsburgh, PA; Portland, OR; Providence, RI; San Francisco, CA; Togus, ME; West Haven, CT; West Palm Beach, FL