

Cardiac Rehabilitation Is Essential in the COVID-19 Era

DELIVERING UNINTERRUPTED HEART CARE BASED ON THE CLEVELAND CLINIC EXPERIENCE

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The unprecedented nature of the COVID-19 pandemic has challenged how and whether patients with heart disease are able to safely access center-based exercise training and cardiac rehabilitation (CR). This commentary provides an experience-based overview of how one health system quickly developed and applied inclusive policies to allow patients to have safe and effective access to exercise-based CR.

Key Words: facial mask • preventive cardiology • SARS-CoV-2 • secondary prevention • severe acute respiratory syndrome coronavirus 2

The persistence of heart disease as the leading cause of death among adults residing within the United States continues to reinforce how important it is for patients to be able to routinely and safely access guideline-recommended medical care in the secondary prevention cardiology clinic.¹⁻³ Close adherence to preventive heart care is proven to play a crucial role in preventing aggressive disease progression, lessening clinical severity, and promoting improved quality of life and functional capacity.^{1,2,4-9} However, the unprecedented incidence of coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has and continues to directly challenge how patients with heart disease are able to routinely and confidently access essential preventive heart care, including on-site exercise-based phase II CR.^{2,5,7-12}

There is a critical role played by public health professionals in helping curb the recurring chance of an exponential rise in COVID-19 transmission.¹³⁻¹⁷ However, it should also be appreciated that for patients with heart disease, any recommendation calling for restricted activities outside of the home environment should be cautious to not unintentionally limit access to participation in exercise as medicine as a cornerstone feature of center-based essential heart care received in the CR clinic.¹⁸ An example of this was the 25% reduction in physical activity observed in patients with implantable cardioverter-defibrillators, during a pandemic-forced 40-d in-home confinement.¹⁹ Even temporary in-

terruptions in the continuity of heart care may yield major unintended future consequences associated with inordinate disease progression coupled with an increased risk of recurrent or new heart-related adverse events. This is an opinion well supported by the proven effects exercise-based CR can have on lowering the risk of secondary events, hospitalizations, and/or death within the 5-yr window following completion of the critical 3-mo on-site experience.^{2,5,7-12}

The objective of this report is to provide an experience-driven overview of how in response to the COVID-19 pandemic, the nine center-based CR programs of the Northeast Ohio Cleveland Clinic Health System continue to work collaboratively to develop and apply policies aimed at providing patients with safe, routine, and effective access to CR. To date, our collective system-wide experiences highlight how we have been able to successfully (1) establish an accessible, effective, and sustainable remote telehealth CR (teleCR) service for delivering uninterrupted care throughout the pandemic; (2) provide patients with routine and safe access to on-site CR; and (3) closely adhere to up-to-date universal safety precautions and recommendations¹³⁻¹⁵ aimed at minimizing exposure and risk of COVID-19 transmission between and among patients and health care staff.

TELEHEALTH AND CR

A major reason explaining why to date there is no established standard of care model for teleCR in the United States has been a lack of fiscal support for this service by the Centers for Medicare & Medicaid Services (CMS). This gap in heart care coverage is relevant because Medicare-/Medicaid-eligible beneficiaries make up an appreciable proportion of all patients eligible for phase II CR.^{12,20,21} For Ohio residents, the consequence of not having an established and CMS-backed teleCR model in place became suddenly relevant when the government mandated a statewide 8-wk shelter-in-place order (March 19, 2020 to May 17, 2020) that included restricted patient access to center-based nonessential medical care. Although recent reports are able to suggest that providing patients with the option of home-based CR can increase access to care²² and participating in distance health can yield similar outcomes as compared with center-based interventions,²³⁻²⁵ the real-world clinical translation of research-oriented and resource-secure models remains unproven on a broad statewide scale where access to resources is not uniform or completely absent for some communities. Therefore, this clinical practice knowledge gap warranted the need for us to leverage our proven expertise in heart care to develop and apply our own teleCR standard of care model.

Based on our vast experiences in delivering on-site CR to patients residing within the greater Northeast Ohio area, it could not be reasonably expected that patients should possess/access smart technology and/or demonstrate proficient

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literacy in using such devices in novel ways. Therefore, the teleCR rehab model we developed for immediate implementation at the beginning of the 8-wk COVID-19 shutdown period was and continues to remain highly sensitive to the need to be inclusive to patients of all backgrounds by focusing on how existing technological resources available at the immediate patient level can be used to routinely communicate and deliver remote care.

By pursuing a teleCR rehab approach that is not exclusive to a particular type of technology, this decision has made it improbable that we would be able to livestream with audio and video presence each enrollee's home-based exercise bouts in one-to-one patient-physician interactions, resembling the reimbursable home-based model temporarily recommended by the CMS under the designation of a public health emergency.²⁶ Instead, we asked our patients who prior to the COVID-19 shutdown had already enrolled and gone through the formal in-person process of risk assessment and developing an individualized treatment plan to journal weekly exercise activities based on parameters and goals outlined within the individualized treatment plan. Enrollees were then given the opportunity to discuss with the CR staff progress made with their exercise, whether they experienced any abnormal symptoms while exercising, and what they should accomplish for the next week during weekly 30-min summary sessions scheduled Monday to Friday during normal business hours (see Supplemental Digital Content, available at: <http://links.lww.com/JCRP/A267>). For weekly teleCR rehab sessions, patients were given the option of using, for example, a smartphone, landline phone, or non-smart cellular phone. Overall, this approach of allowing for teleCR rehab participation to occur regardless of technological acumen and/or device availability played an important role in ensuring our core goals of keeping access to CR inclusive and enabling continual patient engagement throughout the 8-wk shutdown period. Equally important, we are able to report no patient-experienced adverse cardiac events or any other type of complication associated with performing home-based exercise consistent with what was prescribed in the individualized treatment plan.

For patients who recently became eligible for center-based CR at the time of the 8-wk shutdown, these individuals were given the choice to enroll via video-based virtual visit through the electronic medical record system if they had access to a webcam or smartphone, or they could participate in this evaluation using a nonvideo form of telecommunication. Irrespective of technology medium chosen, during the course of a virtual CR entry evaluation with a CR staff member, patients could expect, just as if they were physically present, to have a comprehensive discussion on what is involved in CR, including the full development of the individual treatment plan involving goal setting and creation of an exercise prescription. These patients were then followed once weekly in a similar manner as described previously.

For any individual comfortable with using smart technology and browsing the internet, we also created more passively available heart care resources in the form of complementary Cleveland Clinic-created online content in the form of articles, short videos, and interactive exercise prescription and dietary tools (eg, clevelandclinic.org/healthyheart). The availability of all of this web-based digital content has been well received by patients as being useful and complementary to the opportunities for interactive person-to-person virtual engagement.

Although teleCR rehab has rarely been chosen by phase II CR-eligible patients over the ability to receive on-site care since the removal of restrictions placed on nonessential

medical care, our distance health service as described previously remains a viable option for individuals meeting certain requirements who choose to defer on-site participation.

ACCESSING ON-SITE CARDIAC REHABILITATION AND UNIVERSAL SAFETY PRECAUTIONS

At this mature stage of the COVID-19 pandemic, a paucity of original outpatient data has resulted in an incomplete understanding of how to objectively evaluate the medical appropriateness versus risk associated with participating in on-site CR while applying standard COVID-19 precautions (eg, 6-ft social distancing, nose and mouth facial coverings).¹³⁻¹⁶ Therefore, recent information on CR that is readily viewable in numerous peer-reviewed resources has come in the form of expert opinion statements communicating either theoretical solutions not reflecting recent clinical experiences²⁷ or comments²⁸ that are idealistic in nature as they imply that the modernization of CR is a basic matter of deciding to apply and use easily accessible technologies all while largely overestimating the actual translation of well-resourced telehealth research study methodology to real-world clinical practices and patients of diverse communities and geographic areas, such as Northeast Ohio.

Other exercise-related guidance coming from specialties, such as sports cardiology, has focused largely on the niche population of high-performing active adults and competitive athletes who had already been infected with COVID-19.²⁹ However, neither the medical circumstance nor the target population for such exercise recommendations²⁹ is translational to the generalizable CR population residing in the United States.

The feature core components used to direct our process of reactivating access to on-site CR focused heavily on strategically adapting stationary safety guidelines/recommendations¹³⁻¹⁶ to better reflect the needs of a medically necessary exercise setting (see full details of all measures taken as shown in the Table). Actions taken to date include, for example, ≥ 6 ft of physical separation for exercise equipment allowing for 360° social distancing, setting class volume capacity to reduced levels to accommodate social distancing and time required for rigorous equipment cleaning between classes, donning of surgical masks and face shields for CR staff, and instructing patients to wear nose and facial coverings while exercising—preferably the single-use surgical masks provided by us free of charge. Importantly, these interdependent best care practices to date (as of January 8, 2021) have resulted in no COVID-19-positive cases that could be traced back to the center-based CR setting despite patients participating in >16 000 session hours of on-site CR throughout the Cleveland Clinic Health System. This number reflects phase II classes continuing to be offered 3 d/wk at 60 min/class but operating per time slot (≥ 4 slots/site) within an approximate range of 50-80% pre-COVID-19 capacity at a patient-to-staff ratio never >5:1.

By comparison, for the year prior to the COVID-19 pandemic, our nine CR centers collectively amassed approximately 41 000 session hours of phase II CR. This is volume driven by some of our larger centers, such as the Main Campus and Fairview Hospitals, which are able to accommodate ≤ 15 patients/class across ≥ 6 class times/daily at 3 d/wk all while never exceeding the 5:1 patient-to-staff ratio.

The other major factor that has been highly emphasized by our CR programs throughout the entire COVID-19 pandemic is how important it is to continue to enroll patients

Table**Recommendations for Allowing Patient Access to On-site Outpatient Phase II Cardiac Rehabilitation at the Cleveland Clinic Health System^a***Patient symptom screening and COVID-19 testing policies:*

Complete travel questionnaire—standardized across the health system.

If recently traveled, health interview with COVID-19 team to determine whether COVID-19 testing is necessary.

Daily body temperature screening at main entry of hospitals

≥100.4°F defined as abnormal, requiring patient to undergo health interview with COVID-19 team.

Access to CR restricted until asymptomatic, <100.4°F, and COVID-19 testing performed and negative result confirmed.

If symptomatic, access to CR restricted until asymptomatic, <100.4°F, and COVID-19 testing performed and negative result confirmed.

If asymptomatic, no absolute requirement for COVID-19 testing prior to enrollment

For centers where exercise stress testing is performed at CR entry and exit evaluations, patients must be asymptomatic and have COVID-19 testing with negative result no >72 hr prior to exercise testing.

If already enrolled patient becomes symptomatic, COVID-19 test performed and CR paused until negative result is documented in the electronic medical record and patient is no longer symptomatic.

If COVID-19 test comes back positive, even if no longer symptomatic, CR is paused for ≥28 d starting from the date the sample was collected.

Even after 28 d have passed, patient must be asymptomatic before resuming CR.

Key measures/protections instituted when accessing the on-site card rehab gym environment:

On-site accessibility dependent on the most up-to-date guidance from national, local, and institutional public health and safety assessments of COVID-19 infection risk.

Stage I: Initial reactivation of on-site access to CR on May 18, 2020. Class-size capacity capped at 50% of pre-COVID-19 levels.

Stage II: Increased on-site access. Class-size capacity capped at 80% of pre-COVID-19 levels.^b

Stage III: Class capacity to maximal levels allowed consistent with pre-COVID-19 levels.^c

Social distancing

Physical spacing of exercise equipment ≥6 ft in all directions.

One-way directional signage placed throughout gym.

No exercise blood pressure measurements unless deemed a medical necessity.

Placement of lobby chairs ≥6 ft apart.

No visitors/guests unless deemed a medical necessity as part of standard of care.

Locker and shower use prohibited.

Personal protective equipment (PPE)

Dedicated surgical masks, full facial shields, and laboratory coats worn by CR staff at all times while in CR gym.

Initially,^d patients strongly encouraged to wear surgical mask or cloth nose and mouth facial coverings while exercising in CR gym.

Progression,^e patients required to nose and mouth facial covering at all times during CR exercise.

Strongly encouraged to wear provided surgical masks in place of cloth masks.

Other medical and nonmedical equipment

Exclusive use of medical-grade wipes for cleaning of all surfaces.

Basic equipment assigned to each patient and fully cleaned with medical-grade wipes following each class/use. This includes blood pressure cuffs, clip boards/writing instruments, telemetry, iPads, pulse oximeters (where applicable), and so forth.

Ad libitum access to health system—approved hand sanitizer easily accessible throughout the CR gym.

Abbreviation: CR, cardiac rehabilitation.

^aThe aforementioned policies were current as of January 8, 2021. Policies and recommendations developed under advisement of the Cleveland Clinic Health System Infection Prevention Department.

^bAt this stage as of September 15, 2020.

^cThis stage has not been reached and is TBD.

^dMarch 19 to July 17, 2020.

^eJuly 20, 2020 to January 8, 2021.

within the appropriate post-discharge window and to not allow the fear of COVID-19 infection to serve as a barrier to enrollment.^{2,4,6,9-11,30,31} As such, it is our experience-based opinion that at this phase of the pandemic, timely enrollment in on-site CR can reasonably be expected provided an eligible patient is asymptomatic, has not recently tested positive for COVID-19, has not been recently in contact with a known COVID-19-positive individual, and the prospective center-based program demonstrates adequate staffing and basic knowledge and implementation of universal COVID-19 precautions.^{2,13-16}

We also share, based on our experiences, that for centers where physical gym space may limit CR accessibility due to the need for social distancing and spacing of equipment, a CR access algorithm, such as the one illustrated (Figure), should be used to assist staff in first allocating finite physical resources toward higher-risk patients who may require routine in-person supervision and extended use of teleme-

try monitoring. However, our tiered approach for offering access to on-site CR should not be taken to imply that lower-risk patients are denied access to routine CR guidance. In such cases, patients should be encouraged to use weekly teleCR rehab services where CR staff can continue to use a multimodality approach to discuss heart care topics traditionally expected in the on-site setting, including exercise prescription/progression, increasing physical activity and decreasing sedentary time, heart healthy nutrition, lifestyle modification, adherence to medications, blood pressure control, lipid management, behavioral health counseling, and tobacco/alcohol cessation as needed.

CONCLUSION

The experiences expressed herein reflect how the collective center-based CR programs of the Cleveland Clinic Health System have successfully developed and operationalized

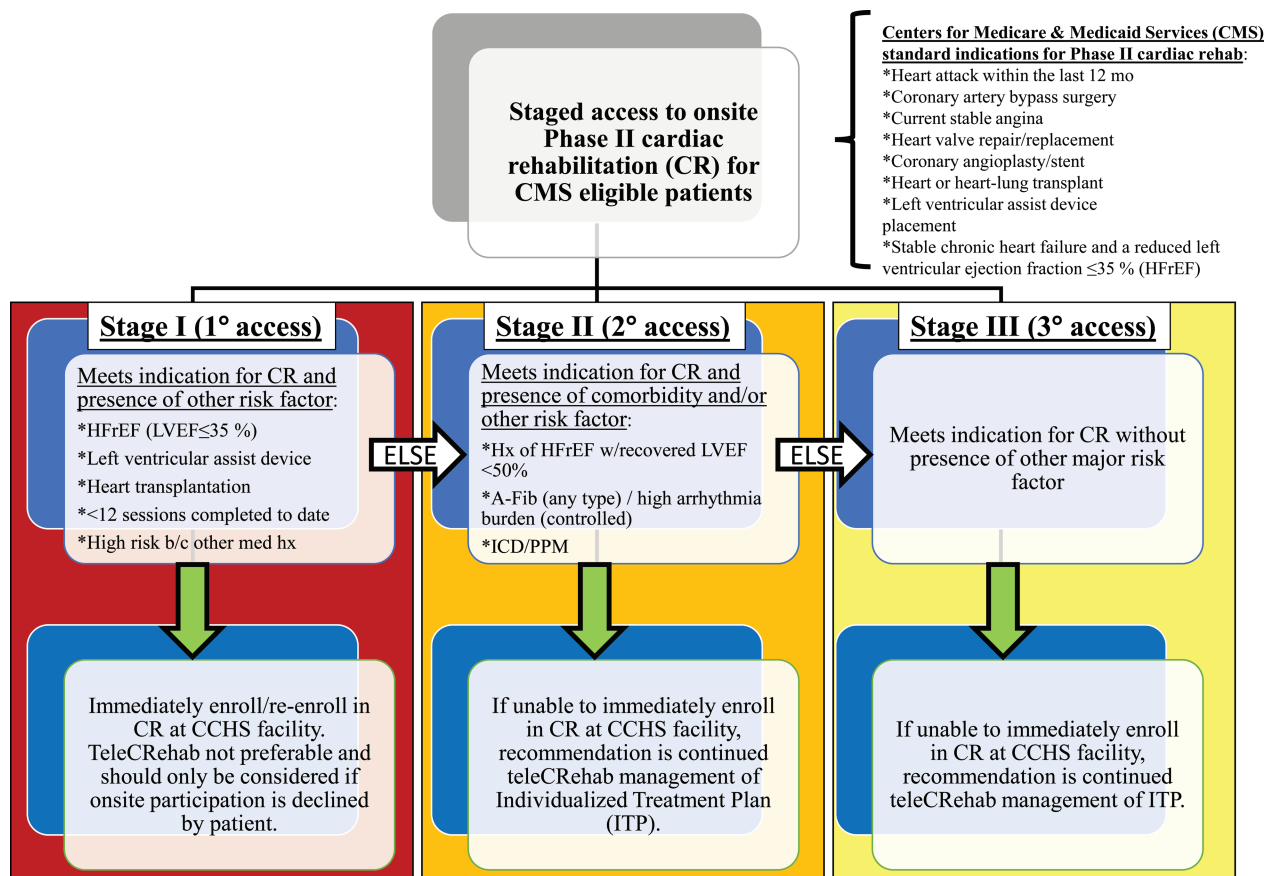


Figure. Social distancing and physical spacing of exercise equipment ≥ 6 ft apart constrain how gym space can be used for offering patient access to center-based phase II cardiac rehabilitation (CR). This schematic illustrates how staged reactivation of on-site CR for Centers for Medicare & Medicaid Services-eligible patients can be effectively implemented to prioritize patient access to center-based care. Abbreviations: CCHS, Cleveland Clinic Health System; ICD, implantable cardioverter defibrillator; LVEF, left ventricular ejection fraction; PPM, permanent pacemaker insertion. This figure is available in color online (www.jcrjournal.com).

a safe, immediately clinically translational, effective, and adaptable CR service for patients in the COVID-19 era. Successfully translating our COVID-19 CR model from the Cleveland Clinic Main Campus Hospital to eight of our various-sized regional health system hospitals underscores that no matter the physical size or daily patient volume of a center, the experience-based policies and standards summarized in this document can be readily implemented with effectiveness in making secondary prevention heart care and CR accessible to patients in the COVID-19 era.

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