GUIDANCE FROM THE CCS COVID-19 RAPID RESPONSE TEAM

The New "Virtual Reality": Practical Approaches to the Delivery of Cardiac Rehabilitation Care during the COVID-19 Crisis

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1. Introduction

Cardiac rehabilitation (CR) programs across Canada have suspended in-person services as a result of large-scale physical distancing recommendations designed to flatten the COVID-19 pandemic curve. As medically supervised or centre-based cardiac rehab (CBCR) is the mainstay of CR care delivery, this guideline-based therapy is at risk of being significantly underutilized. CBCR has unequivocally demonstrated reductions in hospital readmissions, secondary events, and mortality in cardiovascular disease patients. Significant consequences of CBCR suspension may include short- and longer-term adverse events, increased cardiac-related emergency department visits and hospital admissions, and exposure of this vulnerable cardiac population to infection. This all places additional burdens on already strained acute care services. Prolonged closures or reduced access are likely to result in a significant waitlist expansion, perpetuating in-person care delivery delay.

Virtual CR (VCR) offers an alternate mechanism to CBCR, capable of delivering similar patient outcomes and safety profiles for those with low to moderate cardiac risk.[2] However, execution of this can be daunting, particularly for centres without previously established virtual care

programs. Conversely, centres where some home-based/virtual programs are already available, the conversion of all CR participants to VCR brings new challenges, largely around greater resource requirements. A review of the challenges, limitations, and pragmatic guidance on the rapid transition to VCR is outlined below.

2. Principles

- Protect CR staff and patients from undue exposure risk during the COVID-19 pandemic
- Continue CR care delivery during the COVID-19 pandemic to prevent short- and long-term negative impacts on at-risk cardiovascular populations
- Rapidly implement or expand VCR programming to replace lost capacity due to suspension of in-person CBCR services
- Plan for potential capacity growth, based on scalable models of delivery
- Initial focus on collation, utilization and re-purposing of existing resources, equipment, and technology over complex restructuring to allow for rapid deployment
- Adapt VCR programs to ensure care delivery fits the needs of vulnerable populations in a variety of settings, including low-resource, urban and rural
- Develop sustainable and pragmatic VCR programming to address the possibility of prolonged or recurrent restrictions on in-person care, and to improve access to and delivery of CR care during non-pandemic situations
- Ensure virtual care privacy and safety standards pertaining to VCR delivery are reviewed and respected. Utilize available secure technologies

3. Current status of cardiac rehabilitation during COVID-19

Prior to the COVID-19 pandemic, Canadian CR programs fell into one of three categories:
1. Those with no pre-existing VCR experience or programs
2. Those with several CR components delivered virtually (i.e. 'partial' or 'hybrid' VCR)
3. Those with well-established VCR programs integrated into their CBCR programs

Prior to COVID-19, no programs existed as "stand-alone" virtual CR. Patient participation in VCR was determined by eligibility criteria based on risk stratification for cardiac events, and patient factors, such as access to required technology and self-motivation. The majority of programs limited participation to low-moderate risk patients, with higher risk patients enrolled in CBCR. Graded-exercise testing (GXT) informed the risk stratification process.

During the COVID-19 pandemic, up to 50% of all Canadian CR programs have ceased providing any care (unpublished data, personal communication, Dr. Paul Oh). Those that continued adapted to a lack of in-person intake assessments, a potential inability to perform routine GXT risk-stratification, and a lack of in-person exercise monitoring for those deemed to be at "high-risk" of cardiac events. These programs have also innovated using a virtual model to deliver all other CR care components.

The University of Ottawa Heart Institute (UOHI) in Ottawa, and the University Health Network (UHN) in Toronto were reasonably well-equipped for this scenario, due to previously established home and VCR programs. These centres can serve as blueprints, to assist other sites with initial VCR implementation, with readily available online resources.[7,8]

4. Challenges and Obstacles of Care Delivery

Several specific areas of concern surrounding the transition to VCR delivery include:

a. <u>Implementation Challenges</u>
   i. Lack of centre and patient experience with VCR delivery
   ii. Access to affordable, effective required technology
   iii. Potential CR staff redeployment
b. <u>Safe and standardized care delivery concerns</u>
   i. Limited guideline standards to use as benchmarks for implemented VCR programs
   ii. Lack of evidence for entirely virtual programs (i.e. without access to in-person intake assessments, risk stratification by GXT, and the inclusion of high-risk patients)
   iii. Variable technology platforms and literacy, limiting access to virtual care delivery

5. Implementing Virtual Cardiac Rehabilitation (VCR) (Figure 1)

VCR is home-based cardiac rehabilitation (HBCR) delivered by virtual mechanisms. Virtual care refers to any remotely occurring interaction between patients and their care that utilizes information and communication technologies to facilitate or maximize the quality and effectiveness of care. This includes telephone and video-conferencing communication, email, mail, text or other messaging solutions, smartphone applications, online resources, online platforms, and wearable devices.

a) ***Program Goals***
   i) **'Basic, safe and timely'** care should initially be prioritized over '*complex and comprehensive*', particularly for those with no previously established virtual program
   ii) Once a program is established, focus should shift to ensuring traditional CR care delivery standards are met, protocolized patient assessment and follow-up are defined, and workflow is optimized
   iii) Programs should seek resources for supportive technology to enhance care delivery
   iv) Programs should embrace the concept of developing sustainable VCR solutions. This will account for care gaps that existed both prior to COVID-19, and account for potential challenges following the pandemic.

v) Program evaluation should comprise at a minimum: referral reason, CR intake and discharge dates, and data elements to assess adherence to CACPR Quality Indicators.[5]

b) Eligible Patients and Risk Stratification

i) All patients eligible for conventional CBCR should be considered for participation in VCR in some capacity, ideally including a component of exercise training. This includes patients previously excluded from VCR programs prior to the COVID-19 pandemic

- Examples include patients at "high-risk" of events, exercise-induced or otherwise, those with limited access to technology, vulnerable populations, the elderly, and those of low socioeconomic status

ii) Risk stratification and exercise prescription remain a challenging aspect of virtual CR delivery.

- As symptom-limited GXTs may not be available to assist in risk stratification, increased emphasis should be placed on clinical assessment, and alternate methods of obtaining functional capacity to aid in the risk stratification process (i.e. Duke Activity Status Index; self-administered 6 Minute Walk Test)[6]
- Exercise prescriptions for home-based exercise should be conservative and titrated slowly, particularly for patients without an intake GXT, and those deemed to be at high-risk. Target the minimal level of physical activity required to obtain the required health benefit
- Exercise intensity should not exceed moderate while unsupervised
- Patient education on symptom and intensity assessment is paramount
- Patient driven intensity assessment can be achieved by HR palpation, use of available wearable HR monitors, and the 'talk-test'[4]

iii) The risk of excluding patients considered high-risk by CR standards should be carefully balanced with potential benefits of appropriately guided participation

iv) The risks and benefits of participation should be discussed, and informed written consent obtained

c) Resource Limited and Rural Centers

i) Programs with limited resources may require regular phone interactions and educational mail-outs

ii) Individual programs may consider purchasing tablets, smart phones or other electronic options for loan to participants to enhance a "one-on one" personal experience

6. Practical tips from established virtual cardiac rehabilitation programs

a) Utilize tip sheets to help staff adjust to delivering their intervention virtually. ie. https://cacpr.wildapricot.org/resources/Documents/UOHI%20CR%20Home%20Program%20cues.pdf

b) Avoid becoming overwhelmed by the multitude of available resources by finding a single, comprehensive, verified online resource for patients and staff
https://pwc.ottawaheart.ca/resources/covid-19

c) Encourage patients to attend at a minimum, intake assessments to discuss the merits of virtual CR

d) Follow a shared decision-making process regarding VCR enrollment to ensure patients understand potential risks and benefits of participating virtually, versus choosing to delay care

e) Utilize practical approaches to obtaining patient metrics. Examples include remote 6-minute walk test for baseline exercise capacity, having patient use personal scales and blood pressure cuff

f) Focus initial care on core components (lifestyle risk management, psychosocial support, medical advice, education) and simple exercise prescriptions aimed at encouraging low to moderate intensity physical activity. These goals should be achieved prior to implementing complex technologic virtual care systems, or considering higher intensity activities

g) Provide group tele-/videoconferencing for educational sessions and patient support, when possible, to reduce resource intensive 1-on-1 sessions

h) Formalize an evaluation process to assess the merits and efficacy of VCR. This will be enabled by use of CACPR registry software, available free of charge.
https://cardiologica.org/7/?i=cr

7. Planning for the Ebb and Flow of an Uncertain Future

The COVID-19 pandemic is likely to result in varying degrees of care disruptions in the future. Once a virtual CR program has been established, centers should plan for an ebb and flow of care delivery restrictions due to physical distancing recommendations likely to follow the COVID-19 pandemic trajectory. Restrictions on care will fall into three general categories with each level requiring a specific strategy.

Level 1

Minor restriction in regular services, due to persistent health and societal effects of COVID-19, despite low infection rates

- Programs should plan to *integrate* VCR into CBCR, as it is likely programs may be required to operate at lower capacities to adhere to even low-level restrictions, thereby creating a hybrid model of care delivery
- CR care should be individualized, with varying degrees or virtual and in-person care to optimize the risks and benefits to both patients and healthcare workers
- Elements of the CR intervention, such as initial in-person assessment and exercise stress testing may be available, and should be encouraged assuming appropriate PPE is available

Level 2

Major restriction in regular services due to COVID-19 outbreaks or high-risk of potential outbreaks
- ○ Programs should focus on the *improvement and expansion* of VCR
- ○ Alternative methods for key in-person elements such as initial assessment and exercise testing should be sought.

Level 3

Complete inability to provide regular services due to closure of ambulatory facilities or essential staff reassignment
- ○ Programs should offer a *limited form of VCR*. This may be the provision of educational and care resources, with a focus on a higher degree of patient responsibility and less frequent or minimal care-team interactions
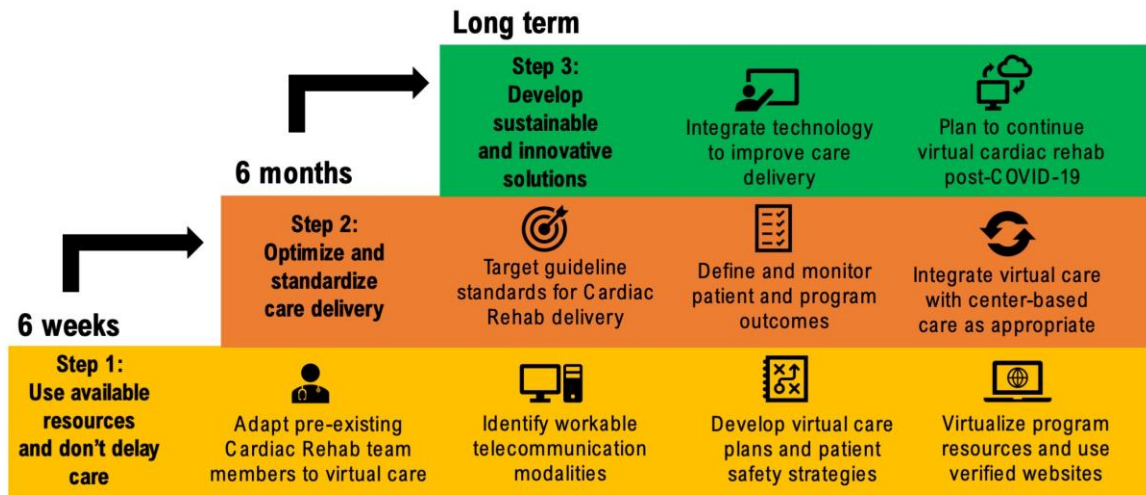
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10. https://www.healtheuniversity.ca/en/cardiaccollege
11. https://cardiologica.org/7/?i=cr

12. ESC/EAPC Cardiac Rehabilitation during COVID-19:
     https://www.escardio.org/Education/Practice-Tools/CVD-prevention-
     toolbox/recommendations-on-how-to-provide-cardiac-rehabilitation-activities-during-the-c

Figure 1: The "Steps" of Virtual Cardiac Rehab Delivery

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Our new "virtual reality"

Practical approaches to delivering cardiac rehabilitation during COVID-19 from the CCS COVID-19 Rapid Response Team

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What is "virtual cardiac rehabilitation"?

Virtual cardiac rehabilitation (or VCR) is home-based cardiac rehabilitation (HBCR) delivered by virtual mechanisms. Virtual care refers to any remotely occurring interaction between patients and their care that uses communication technologies to facilitate or maximize the quality and effectiveness of care. This includes telephone and video-conferencing communication, email, mail, text or other messaging solutions, smartphone applications, online resources, online platforms and/or wearable devices.

Setting up your virtual cardiac rehabilitation program: Guidance for Clinicians

1. Determine the GOALS of your virtual cardiac rehabilitation program

In the beginning…

"Basic, safe and timely" care should initially be prioritized over "*complex and comprehensive"*, particularly for those with no previously established virtual program.

Once your program is established…
Shift focus to:
- ensuring traditional cardiac rehabilitation care delivery standards are met;
- protocolized patient assessment, risk stratification and follow-up are defined; and
- workflows are optimized.

👉 **Develop sustainable VCR solutions to account for care gaps that existed prior to and post COVID-19.**

2. Decide who is ELIGIBLE for your virtual cardiac rehabilitation program

All patients eligible for conventional centre-based cardiac rehab should be considered to participate in VCR in some capacity, ideally including a component of exercise training.

This includes patients who were typically excluded from VCR programs prior to the COVID-19 pandemic:
- Patients at "high-risk" of events, exercise-induced or otherwise
- Those with limited access to technology
- Vulnerable populations, including the elderly and those of low socioeconomic status

Risk stratification and exercise prescription is both challenging and paramount.

- Symptom-limited GXTs may not be available
- Increased emphasis should be placed on clinical assessment and alternate methods of obtaining functional capacity
- Exercise prescriptions should be conservative, titrated slowly and not exceed moderate intensity
- Initially target the minimal level of physical activity required to obtain the required health benefit
- Educate patients on symptom and intensity assessment

Practical tips from established virtual cardiac rehab programs

MAKE IT EASY
- Use [tip sheets](#) to help staff adjust to delivering care virtually
- Avoid becoming overwhelmed by the multitude of available resources by finding a single, comprehensive, verified online resource for patients and staff

DON'T WAIT!
- Encourage patients to attend at minimum intake assessments to discuss the merits of VCR
- Follow a shared decision-making process regarding VCR enrollment to ensure patients understand potential risks and benefits of participating virtually versus choosing to delay care

FOCUS ON CORE COMPONENTS
- Focus initial care on core components (lifestyle risk management, psychosocial support, medical advice, education)
- Provide simple exercise prescriptions aimed at encouraging low to moderate physical activity

PRACTICALLY OBTAIN PATIENT METRICS
- Examples include self-administered 6MWT for exercise capacity, utilizing patients' personal scales and blood pressure cuffs

OFFER GROUP SESSIONS
- Reduce "labour-intensive" 1-on-1 sessions when possible by providing group tele-/video-conferencing for educational sessions and patient support

EVALUATE IT
- Formalize an evaluation process to assess the merits and efficacy of virtual care

INVEST IN ACCESS
- For rural and/or under resourced area, consider purchasing tablets, smart phones or other electronic options for loan to participants to enhance a "one-on one" personal experience

Plan for the ebb and flow of care disruptions

The COVID-19 pandemic is likely to result in varying degrees of ongoing care disruptions. Once a virtual CR program has been established, centers should plan for an ebb and flow of care delivery restrictions due to physical distancing recommendations likely to follow the COVID-19 pandemic trajectory. Restrictions on care will fall into three general categories, with each requiring a specific strategy.

Level 1: Minor restriction in regular services due to persistent health and societal effects of COVID-19 despite low infection rates	**Level 2:** Major restriction in regular services due to COVID-19 outbreaks or "high-risk" of potential outbreaks	**Level 3:** Complete inability to provide regular services due to essential staff reassignment
INTEGRATE Programs should plan to *integrate* virtual rehab into centre-based rehab as it is likely programs may be required to operate at lower capacities to adhere to even low-level restrictions.	**IMPROVE & EXPAND** Programs should focus on the *improvement and expansion* of virtual CR. Alternate methods for key in-person elements such as initial assessment and exercise testing should be sought	**ADAPT** Programs should offer a *limited form of virtual CR*. This limited form may be the provision of educational and care resources and focus on a higher degree of patient onus and less frequent or minimal care-team interactions