

# Delivery of the Physical Activity and Exercise Component of Core Cardiovascular Rehabilitation during the COVID-19 Pandemic

A Guidance Document from the BACPR Exercise Professionals Group (EPG)

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The COVID-19 pandemic continues to disrupt the delivery of most standard NHS services including cardiology and the important related area of cardiovascular prevention and rehabilitation. The provision of comprehensive cardiac rehabilitation (CR) still remains a priority, as stated in the BACPR/BSC/BHF joint position statement (Dawkes et al., 2020). To maintain provision, CR programmes have changed from a centre-based, face-to-face delivery, to individualised home-based programmes that are remotely monitored. However, there remain challenges to safe and effective delivery. The original guidance (August 2020) has been updated to reflect changes in local and national restrictions. It focuses on the same areas of Assessment, Physical Activity and Exercise Guidance, Sedentary Time Reduction, Patient Education, Delivery Options, and Discharge from Core Programmes. Further guidance is presented in a supplementary document which focuses on the following sections:

- 1. Considerations for face to face functional exercise testing (FET) in home, community and centre-based settings**
- 2. Considerations for face to face delivery of a group exercise session**
- 3. Considerations for remote assessment**
- 4. Considerations for remote delivery of a group exercise session**
- 5. Considerations for transfer from core (phase III) to community exercise (phase IV) programmes**

This document, and the supplementary guidance document, remains a living document and will continue to be updated following developments in government and public health guidance related to the COVID-19.

In this document the term 'Core' is used to refer to outpatient rehabilitation, formerly referred to as Phase III Cardiac Rehabilitation.

Table 1. Summary of Key Guidance for PA and Exercise delivery of Core Cardiovascular Rehabilitation during the COVID-19 Pandemic

<p><b>1. Assessment</b></p>	<p>A comprehensive assessment needs to be conducted for each patient, as per BACPR guidelines. Initial assessment via telephone and/or video will be required plus consideration whether a face to face session, either home-based or centre-based, is appropriate to conduct a functional exercise test..</p> <p>In the absence of a functional exercise test (FET), exercise professionals can utilise validated tools (e.g. Duke Activity Status Index) and detailed history taking to gauge the patient's current level of activity and exercise tolerance.</p>
<p><b>2. Physical Activity and Exercise Guidance</b></p>	<p>Without an FET, exercise professionals will be providing exercise recommendations rather than exercise prescriptions. Regular reviews of patient progress should be made.</p> <p>Use of resources such as CR home-based exercise booklets, exercise videos, and online or app-based delivery can be utilised when possible to ensure safe and effective patient exercise. The limitations and potential errors of any resources or technology used needs to be considered.</p>
<p><b>3. Sedentary Time Reduction</b></p>	<p>Reducing the sedentary time of all CR patients is essential during the pandemic. For high risk patients, and those with low exercise capacity, reducing sedentary time may be an appropriate and effective starting point rather than specific exercise advice.</p>
<p><b>4. Patient Education</b></p>	<p>CR education remains essential, however individual education sessions may be too time consuming. Delivery options should be considered such as: printed information posted or emailed to</p>

	patients, pre-recorded sessions, or through 'live' virtual sessions to groups.
<b>5. Delivery Options</b>	The safe delivery of exercise remains an issue for patients enrolled onto a CR programme, even with an initial FET. Online video platforms should be considered, providing Trust Information Governance (IG) and Data Protection requirements are met. In addition, app-based resources may prove useful but should have a robust evidence base
<b>6. Discharge from Core CR programme</b>	Patients completing their CR programme require a comprehensive assessment prior to being discharged. Referral to ongoing support and maintenance services should be made when appropriate, and available.

## 1. Assessment

An essential part of the CR journey is a comprehensive assessment process. This needs to be protected. However, the current situation poses many challenges to conducting this assessment, and a temporary change in this process will need to be made. Much information can be obtained from patient referral forms, electronic patient records, and GP and Specialist Nurse databases, prior to the initial contact. These can be used to develop a detailed picture of the patient journey. Conducting the initial assessment through telephone or video consultations can provide a platform to gain further insight into the patient's previous and current levels of activity, ongoing symptoms, relevant comorbidities and events e.g. recent falls. If the patient has a home blood pressure monitor (HBPM) or pulse oximeter, this could provide additional information for the assessment. The assessment offers an important opportunity to develop a rapport with the patient, and anecdotal evidence from CR teams has suggested this initial assessment is easier when using video calls. Video consultations are therefore preferable to telephone, providing this option is available. Although there can be potential risks regarding confidentiality and patient privacy with this format, pre-planning with the patient to make sure they are in a suitable location

prior to the assessment and utilising a secure network for video calls e.g. Attend Anywhere can minimise these risks.

As well as establishing the patient's physical activity (PA) and exercise history, part of the comprehensive assessment is 'real-time' observation of the patient and how they respond to exercise through the functional exercise test (FET). Specific guidance related to returning to face to face (F2F) FETs is provided in the supplementary guidance. However, for those programmes who cannot yet return to F2F exercise assessments, exercise professionals are restricted in what exercise information they can gather to inform any PA guidance, let alone an individualised and structured exercise prescription. The use of the AACVPR Risk Stratification Tool can be made to establish an initial risk level, based on the non-exercise test findings. This can be supported by establishing the patient's current PA and exercise levels. Validated measures such as the Duke Activity Status Index (DASI) can be used to estimate the patient's current exercise tolerance, providing an idea of what METs level they can comfortably achieve (Hlatky et al., 1989; Shaw et al., 2006; Coutinho-Myrrha et al., 2014; Reed et al., 2020). Although there are potential issues with patient-reported PA measures, using a combination of the above tools will help to give a clearer picture of the patient's tolerance of PA and exercise during the assessment. Physical activity trackers may also be helpful to establish baseline PA status.

When the return to F2F clinics and/or appointments are possible within local NHS Trust/health boards/organisations, the options for assessment and exercise capacity assessments should be considered. Following initial assessment over video or telephone, patients could then attend CR for an FET only, with ongoing support via video consultation. Another possibility is for the FET to be conducted during a home visit (e.g. 6-minute walk test), following the initial video or telephone assessment (please see specific guidance for the return to F2F assessment in the supplementary guidance document).

## 2. Physical Activity and Exercise Guidance

Home-based CR is a safe and cost-effective delivery option that has comparable outcomes to centre-based delivery (Anderson et al., 2017, Batalik et al., 2020; Yeo, Wang and Low, 2020). However, most home-based programmes require a pre-FET as part of the initial

assessment. For CR programmes that cannot currently perform an FET, exercise professionals are limited to providing “exercise recommendations” rather than “exercise prescriptions”. The CR exercise professional must use their judgement to decide which recommendations are appropriate for each individual patient, and they are reminded of the need to only work within their own level of competency and scope of practice. As always, guidance from senior members of the CR team should be sought where needed. PA and exercise guidance should start at low intensity and duration, and progress slowly with regular reviews. The estimated max-METs value from the validated DASl could be used to guide recommendations. However, it is important to not just estimate an individual’s maximal capacity, but also establish the submaximal MET level the patient can sustain without undue fatigue, strain or breathlessness. A starting point for equating such exertion levels to submaximal METs is Ainsworth et al.’s Compendium of Physical Activity (2011).

If technology can be used to collect a simple heart rate response and rating of perceived exertion (see guidance below) during typical activities of daily living, this can go a long way to knowing how much more the patient can do before reaching an unsafe level of exertion. Daily step counts have been used effectively to promote increased PA and affect behaviour change to adopt a more physically active lifestyle. In all cases with exercise reporting and monitoring, it is important that patients are provided with some type of structured diary or reporting system. The following points are not exclusive but provide some typical examples of monitoring and exercise modalities:

- i. Response to exercise can be assessed using Rating of Perceived Exertion (RPE) scales and monitoring symptoms to establish the patient response to the intensity. The PA and exercise levels of the patient, along with corresponding RPE and symptoms, should be logged in the patient records. A detailed and accurate account of patient feedback will then make any progression or regression of the patient’s recommendations easier. Progression should be made through the adoption of the FITT principles. Patient compliance with the advice should also be assessed and taken into account for further recommendations, or possibly to re-risk stratify the patient if required.
- ii. If patients have access to exercise equipment at home (providing it is deemed suitable), then patients can make a note of their RPE and/or HR in relation to speeds

and gradients and workloads (from static bikes and treadmills) and note the duration they can achieve at these. From ongoing reviews, these act as quasi assessments from which exercise professionals may be able to give some more specific recommendations on duration and intensity.

- iii. Some patients may have activity trackers on their phones or other devices, pedometers, or wearable technology such as heart rate monitors that could be utilised to develop a clearer picture of activity and further support recommendations for exercise. It is expected that exercise professionals will ensure they fully understand the limitations and potential errors of any resources or technology used and frame their guidance with this in mind.
- iv. As per standard CR practice, any PA and exercise recommendations should be reviewed with each patient on a regular basis. A realistic plan should be made to follow-up on patient's activity levels. The frequency of follow-up will depend on patient need and the availability of CR staff and patient caseload. However, establishing this early will help to manage the expectations of the patient.

Improving the strength and functional capacity of cardiac patients through safe and effective resistance training is an important part of comprehensive CR. Research has shown that the demands placed on the cardiovascular system can be lower during resistance exercise compared with aerobic exercise, with a lower myocardial oxygen demand (Tokmakidis, 2002; Volaklis & Tokmakidis, 2005; Marzonlini et al., 2011). This should provide confidence to exercise professionals working remotely to include some form of resistance training – with a “low and slow” starting point like other PA and exercise recommendations. Standard considerations also need to be made for patients who are post-sternotomy or device implantation regarding when to return to resistance training as some activities will be limited for a number of weeks post-surgery. Although some patients may have HBPM, the BP response to resistance training will be difficult to assess.

Most CR patients may not have previous experience of resistance training, and with the requirement to maintain good technique being paramount, the use of home-exercise booklets or even video instruction should be utilised. Exact resistances can be quantified

through using household items such as cans or bottles of water, and progressed gradually as tolerated. Body weight exercises such as wall press ups or lunges may also be suitable. However, advising the restriction of exercises with major postural changes may be prudent (e.g. sit to stands or floor-work), especially during early exercise recommendations and with patients with a history, or current symptoms, of postural hypotension. Another consideration is the use of resistance bands. Some CR programmes currently provide resistance bands for patients to use at home along with instruction booklets or video support. However, exercise professionals should consult local guidance if this is something they have not done previously, as some Trust/organisations do not permit the use of resistance bands for health and safety reasons.

Not all patients are new to resistance training however, and patients with a history of resistance training may wish to restart as soon as possible. Correct form and technique still need to be assessed as poor technique could have developed over time. Further consideration of home equipment availability needs to be made. Some patients may have a “home-gym” with a range of resistance equipment that may not be suitable due to the nature of exercise (e.g. bench press) or level of resistance. Explaining to the patient the importance of an initial “low and slow” approach will help ensure their compliance with your recommendations.

### **3. Sedentary Time Reduction**

Advice on the benefits of reducing sedentary behaviour and increasing active minutes is important for patients enrolled on a CR programme, and during the current pandemic provides exercise professionals with a strongly evidence-based strategy that remains entirely accessible to patients during lockdown, even for vulnerable patients who are continuing to ‘shield’. Increased sedentary time is associated with increased mortality; regular breaks in sedentary time is thought to increase overall energy expenditure, directly influencing cardio-metabolic risk factors, and for older adults there may also be an association with enhanced ability to manage activities of daily living (Ramadi and Haennel, 2018). It is an attractive strategy to employ for high risk patients, those who are very

deconditioned, and those with limited mobility. Initial advice for these patients should focus on reducing sedentary time prior to giving any advice on more structured PA or exercise. In addition, reducing sedentary behaviour is essential for patients who are able to tolerate moderate to vigorous physical activity. Interrupting sedentary time with light physical activity is a lifestyle change that may be easier to sustain in the long term, and as such should be encouraged alongside moderate to vigorous physical activity. If patients have access to wearable technology, these may offer useful cues and prompts to reduce sedentary time, count steps, and increase active minutes (Prince et al, 2018).

#### 4. Patient Education

A key goal of any CR programme is to provide advice and reassurance to cardiac patients and their families. This advice is essential for empowering patients to preserve or return to their optimal level of functioning within the community (BACPR, 2017), and can be readily provided, remotely. However, patients and families will now be seeking advice related to COVID-19, as well as their heart condition. Many of our cardiac patients are amongst the group of 2 million people identified by the Government as “most vulnerable to COVID-19” due to their cardiac condition ( [Guidance on shielding and protecting people who are clinically extremely vulnerable from COVID-19](#) and [BHF ‘Coronavirus and your health risk’](#) ). In addition, many patients with cardiovascular disease may have other comorbidities (such as respiratory conditions) that place them in the “high-risk” or previously “shielding” categories. As a result, there has been an increased number of calls to CR programmes for advice and support with many CR staff finding answering these concerns to be a major part of their working day. CR teams will need to ensure the advice they provide to patients is in accordance with the most up to date [government guidance](#) . Any COVID-19 related advice will be in addition to the standard advice CR programmes provide to reassure patients and their families about their heart condition and recovery. A key result of this advice is to reduce unnecessary hospital admissions. Due to the current demands on the NHS, this support is more important than ever. However, [recent data](#) has shown a reduced number of people accessing other NHS services such as A&E. This highlights the key role CR teams must



take to signpost patients to emergency services, and ensure patients attend specialist services when necessary.

It is still important for exercise professionals to provide specific education relating to the exercise component of CR, including safety information, principles of warm up/cool down, pacing, and symptom management. With the current demands placed on CR programmes due to the pandemic, individual education sessions via telephone or video call may not be a suitable alternative to the standard face-to-face group session. Other options include posting copies of education talks or relevant written information prior to a follow-up phone call. Patients can also be signposted to useful resources on the BHF website. Staff could record themselves giving the education session which can then be emailed to patients. Alternatively, recordings can be made available via a protected portal, with some hospitals already having these in place. Providing 'live' online group education may replicate the standard delivery of CR, however, further discussion with Hospital/Trust IT department and information governance teams may be required prior to going live. Offering a "menu of options" will result in patients being able to choose the most appropriate format for themselves.

## 5. Delivery Options

Some CR programmes have been able to return to some form of face-to-face delivery, whether this be assessments and FETs, or even group-based class delivery. Unfortunately, if infection rates continue to rise and local restrictions change according to the new Tier system, a return to completely remote delivery may follow. Even when a patient has a known exercise tolerance, established through a functional exercise test (FET), the safe delivery of any exercise, remains an issue. Some rehabilitation programmes have made a successful move to online or video exercise delivery with 'closed groups' of patients who have completed an FET. Where possible this should be considered. However, this requires finding a platform to facilitate delivery of exercise in accordance with the legal requirements of your Trust's Information Governance and Data Protection policies. CR programmes can also make use of available resources such as the [BHF Cardiac Rehabilitation at Home exercise videos](#) which are available online, or utilise their own home-exercise booklets.

Services could consider the use of the many online or app-based resources to support remote delivery. As stated earlier, there is strong evidence that home-based CR is as effective a centre-based CR, as long as it is comprehensive (Anderson et al., 2017; Batalik et al., 2020; Yeo, Wang and Low, 2020). As online or app-based resources have differing delivery and content, and often have a purchase or subscription cost, CR teams will need to decide on the most appropriate resource for their service. It is recommended that ones with an evidence-base of effectiveness should be used.

Although some CR programmes have returned to F2F, assessments and socially distance group classes, this is unlikely to be the case for all programmes for some time. Utilising the opportunity now to develop a workable online delivery may be appropriate to ensure patients can continue to access a quality service in a format which they desire/require.

## 6. Discharge from Core CR programme

As stated in standard five of the BACPR Standards and Core Components (2017), upon completion of their CR programme (recommended by BACPR/BCS/BHF to be a minimum duration of eight-weeks), patients should complete a final assessment. The minimal provision recommendations from the BACPR/BCS/BHF joint statement (Dawkes et al., 2020) state this should be via telephone or video consultation and should be followed by referral to ongoing support services, such as community exercise programmes (previously referred to as Phase IV CR), where relevant and available. If a discharge FET is not available, the patient's response to PA and exercise during their CR programme can be used to guide instructors that are providing this ongoing support. Exercise professionals should keep in contact with their usual providers of ongoing CR support in the community to ensure they are aware of what services are currently being offered and in what capacity. As with Core CR, other services may also have switched to online or virtual classes. With different restrictions on public and private gyms, some F2F groups may be available in the local area. Making patients aware of the options available for their long-term support and maintenance will help them decide on the most appropriate referral option.

## Summary

The delivery of comprehensive CR remains a priority during the current pandemic (Dawkes et al., 2020). In order to deliver CR in a safe and effective way, changes in service delivery have been required. For example, temporary changes in how the comprehensive assessment is conducted has ensured this essential part of the rehabilitation journey has not missed. CR teams continue to adapt their delivery of PA and exercise advice and patient supervision. Whilst these changes have presented extra demands on CR teams, opportunities have been taken to explore and develop home-based CR delivery, adding a new choice to the “Menu of Options” of CR programme delivery. Going forward, this will no doubt increase CR uptake rates, especially for those who find it difficult to attend CR (such as patients who are returning to work, women, and patients who are housebound or unable to travel) as identified in the NACR 2019 report.

## Resources for Video Consultations

There is a range of different platforms available for video consultation for patients, and it will depend on your local Trust/organisation as to which one is adopted, and when. Below are some useful resources:

[NHS England Clinical guide for the management of remote consultations and remote working in secondary care during the coronavirus pandemic](#)

[Chartered Society of Physiotherapist \(CSP\) - Guidance on conducting remote consultations, 2020\)](#)

**NHS: Video conferencing technology in primary and secondary care**

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