

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Medical Technologies Evaluation Programme

Digital supported self-management technologies for adults with chronic obstructive pulmonary disease: early value assessment

Final scope

February 2024

1 Introduction

The topic has been identified by NICE for early value assessment (EVA). The objective of EVA is to identify promising technologies in health and social care where there is greatest need and enable earlier conditional access while informing further evidence generation. The evidence developed will demonstrate if the expected benefits of the technologies are realised and inform a final NICE evaluation and decision on the routine use of the technology in the NHS.

2 Description of the technologies

This section describes the properties of digital supported self-management technologies based on information provided to NICE by companies and experts, and information available in the public domain. NICE has not carried out an independent evaluation of this description.

Supported self-management refers to increasing the knowledge, skills and confidence a person has in managing their own health and care by putting in place interventions such as: peer support, self-management education and health coaching ([NHS England](#)).

2.1 Purpose of the medical technology

In the UK, an estimated 1.2 million people are living with chronic obstructive pulmonary disease (COPD). COPD exacerbations are the second most common cause of emergency hospital admissions, accounting for 1 in 8 of all UK hospital admissions. Exacerbations requiring hospital treatment are associated with poorer prognosis and an increased risk of death ([NICE Clinical Knowledge Summaries, 2023](#)). [CORE20PLUS5](#) lists the prevention of

exacerbations and hospital admission among people with COPD a key priority.

[NICE NG115](#) recommends that people who have had an exacerbation of COPD are provided with an individualised exacerbation action plan, for early recognition of future exacerbations, management strategies (including appropriate provision of antibiotics and corticosteroids for self-treatment at home) and a named contact.

For people with COPD, the following should be offered before commencing pharmacological treatment: offering smoking cessation, offering once-only pneumococcal vaccination and an annual flu vaccination, offering pulmonary rehabilitation, co-developing a personalised self-management care plan and optimising treatment for co-morbidities. These should be reviewed at each patient contact.

For people who are more symptomatic and taking pharmacological treatment, their inhaler technique, compliance with administration instructions and tolerance of the current device should be checked before stepping up treatment to the next stage in therapeutic management of COPD.

The [NHS Long-Term Plan](#) includes commitments related to respiratory disease, including the need to detect respiratory diseases earlier, ensuring pharmacological treatment is appropriate. It also highlights the use of digital tools that should be offered to provide support to a wider group of people with COPD with self-management support and pulmonary rehabilitation and to ensure breathlessness is managed effectively. The Long-Term Plan also recognises the role for COPD management in the community is large and support is required to help people with COPD manage their condition at home.

Recommendations from [Get It Right First Time](#) include optimising care for people with COPD to reduce length of stay, readmission rates, and overall mortality by using discharge bundles which may be supported by digital technologies.

2.2 Product properties

This scope focuses on digital technologies for supported self-management for adults with COPD. Following referral and initial assessment, digital technologies can be used to improve the management of people with COPD.

Digital technologies could improve chronic disease management of COPD care by enabling self-monitoring, early detection of exacerbations, allowing the person with COPD to better distinguish between a true COPD

exacerbation and a variation from their baseline health which doesn't meet the clinical definition of an exacerbation, improved medication adherence, access to educational resources, telehealth consultations, and data-driven decision-making with input from people with COPD and clinicians. These capabilities can contribute to more effective COPD self-management and better patient outcomes, aligning with the goals of COPD discharge bundles and ongoing care.

For this EVA, NICE will consider digital supported self-management technologies that:

- are intended for use by adults
- include multicomponent, multidisciplinary interventions that are tailored to the individual person's needs
- facilitate the delivery of a supported self-management programme
- meet the standards within the digital technology assessment criteria (DTAC), and have a CE or UKCA mark where required
- are available for use in the NHS

Currently identified important features that digital technologies for supported self-management of COPD could provide include:

- personalised self-management plans to prevent worsening health outcomes such as admission avoidance and prevention of exacerbation
- recording of patient reported outcomes (PRO) to identify trends
- education (particularly patient-specific) to improve understanding of COPD and self-management
- medication reminders to support adherence
- exacerbation management (including ensuring appropriate use of steroids and antimicrobials)
- monitoring during exacerbations
- communication functions to allow healthcare professionals to monitor/respond between exacerbations
- sharing information between settings/practitioners involved in the individual's care
- increasing baseline exercise activity (via non pulmonary rehabilitation methods)
- trigger identification
- smoking cessation

12 technologies for adults with COPD are included in the draft scope. While some may include aspects of pulmonary rehabilitation, this is not the focus of this EVA.

Active+me REMOTE

Active+me REMOTE (Aseptika) is a cloud-based platform that supports the hybrid delivery of pulmonary rehabilitation and remote monitoring of adults with COPD at home. The platform is also used for self-management as well as virtual wards. The Active+me REMOTE app includes an education programme delivered in small lessons and interactive exercise videos that increase in difficulty as a person's fitness and strength improves. The technology also collects patient-generated data via an add-on pulse oximeter, spirometer and smart inhaler. The technology can be accessed via a mobile phone, tablet or desktop.

CliniTouch Vie

CliniTouch Vie (Spirit Health) is a web-based platform using risk scoring to provide a real time clinician dashboard. It also provides patient education. Patients can log into the platform and answer clinically approved questions, and take a range of vital signs like blood pressure and oxygen saturation. Patients can be contacted by the clinical team within the platform.

COPDhub

The COPDhub (ICST) app serves as a digital personalised care plan for people with COPD. It includes a monthly COPD checker to track symptoms and offers real-time guidance to identify those at risk. The app provides educational content, downloadable care summaries, and reminder features to support better self-management of COPD. It also features the COPD assessment test [CAT] and the Modified British Medical Research Council [mMRC] score functionality for assessment. It can be used to record healthcare data such as GP appointments. In its educational section, the app offers informative videos on inhaler techniques and breathing exercises to assist in managing COPD effectively.

COPD Predict

COPD Predict (NEPeSMO) is a digital self-monitoring solution with AI-enabled exacerbation prediction capability for people living with COPD. The app is designed to facilitate a model of care focussed on prevention by combining remote monitoring and patient-personalised exacerbation prediction. Proprietary prediction algorithms are constructed from time-series data on symptoms, lung function and biomarkers in blood/saliva supplied by patients using a bespoke app that connects wirelessly to monitoring devices. There is also a dedicated web-based Clinician Early Warning System that provides alerts on impending exacerbations, allowing timely intervention.

Current Health

Current Health (BEST BUY Health) is an app that provide patients with tools to monitor and manage their own health, tailored to their individual needs. It helps patients manage their own care with automated messaging and reminders. Current Health technology supports people with COPD by enabling remote monitoring and facilitating early hospital discharge. People showing signs of clinical deterioration who present to emergency departments or in community care are monitored at home, preventing unnecessary hospital admissions. This technology has clinical team capacity through a Central Monitoring Hub, staffed by trained staff proactively monitoring vital signs and responding to health alarms.

DOC@HOME

DOC@HOME (Docobo) is a digital platform for remote monitoring and case management, suitable for use in residential settings. It enables remote patient monitoring by collecting vital signs such as blood oxygen levels via home pulse oximetry kits, blood pressure, weight, and temperature. Users can also log their symptoms. The platform offers relevant self-help information and alerts healthcare professionals to critical changes such as reduced blood oxygen levels, potentially facilitating prompt medical intervention.

Lenus

Lenus COPD Support Service (Lenus Health Ltd) is a remote management solution designed for people with COPD. The app offers standardised self-management advice and personalised care plans, with the option for clinicians to activate a rescue plan when necessary. Users can input patient-reported outcome measures and maintain a symptom diary, while also having the ability to communicate non-urgent queries with their clinical care team through a messaging feature. A website provides additional self-management resources. For clinicians, there's a dashboard that integrates data from electronic health records, PROMs, and wearable devices for remote monitoring. The technology combines data from patient-reported outcomes, medical and wearable devices, and clinical records and can highlight any patients at risk enabling early intervention. People can also manage their appointments through the platform.

Luscii

Luscii (Luscii) is a patient-facing application designed for people to manage their COPD. It allows users to self-monitor by recording their symptoms, completing assessments from recognised questionnaires, and measuring vital signs like oxygen saturation levels. The app integrates with portable monitoring devices to upload data. It also provides educational resources including updates, information on effective inhalation methods, strategies for coping with COPD, and motivational messages to promote self-management

of COPD. The application allows users to contact their healthcare team and it also supports video consultations.

MyCOPD

myCOPD (my mhealth) is a self-management platform designed for people of any stage with COPD. The myCOPD app provides education on correct inhaler use, a self-management plan, prescription assessment, and symptom tracking, allowing clinicians to remotely monitor and support patients in managing their COPD effectively ([MTG68](#)).

patientMpower

The patientMpower (patientMpower) platform is designed for individuals with respiratory conditions, focusing on remote monitoring and self-management. It includes a patient-facing app with integrated medical devices for objective data collection and questionnaires for subjective measures. This app records physiological parameters such as spirometry, pulse oximetry, and blood pressure, along with patient-reported outcomes. People can also monitor exercise, air quality, and medication compliance. The platform empowers healthcare professionals to create virtual care pathways. It facilitates remote monitoring of clinical data and offers medication reminders, supporting stable users and enabling quick intervention for deteriorating cases through a clinician web portal.

Space for COPD

Space for COPD (University Hospitals of Leicester NHS Trust) is a digital self-management programme designed to help people with COPD manage their condition more effectively. SPACE for COPD is a structured programme of exercise, education and psychosocial support. The programme contains educational topics including information about medication, breathing control, exercise and nutritional advice. Users are encouraged to set goals, progress through a prescribed exercise programme and achieve weekly targets. The technology can be accessed via a mobile phone, tablet or desktop. Clinicians are able to monitor user logins, progress and well-being on the programme and they are also able to answer any questions that the user may post to them.

Wellinks

Wellinks (Wellinks) is a comprehensive virtual care solution designed to empower COPD patients. It offers three main components: virtual pulmonary rehabilitation to enhance fitness and lung function, health coaching for self-management support by respiratory professionals, and a patient-centred app with connected devices such as pulse oximeters and spirometers for remote monitoring and education.

3 Target condition

COPD is a long-term and progressive respiratory condition that causes breathlessness, a persistent chesty cough, persistent wheezing and frequent chest infections. The term 'COPD' includes chronic bronchitis and emphysema. COPD mainly affects older adults who smoke, and many people do not realise they have it. COPD is categorised into four stages according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines based on the severity of airflow limitation which is measured by spirometry. These stages are mild, moderate, severe, and very severe. The progression from one stage to the next varies significantly among individuals, with some remaining stable for long periods, while others may progress more rapidly. COPD progression depends on a variety of factors including smoking status, age, baseline lung function, and comorbidities.

The breathing problems experienced with COPD tend to get worse over time and can limit a person's ability to undertake daily activities. COPD cannot be cured or reversed but treatment can help keep the condition under control which includes stopping smoking, using pharmacological treatment such as inhalers and tablets, pulmonary rehabilitation, and surgery. Smoking cessation is the most effective intervention to slow the progression of COPD.

COPD can lead to episodes where symptoms suddenly get much worse than their normal state, known as exacerbations, which might require additional treatment and can impact overall health and in some cases be life-threatening. There is a seasonal variation, with exacerbations being more common during the winter months, likely due to increased viral and bacterial infections during this time.

In 2020 to 2021, [NHS Digital](#) reported that approximately 1.17 million people (1.9% of the population) in England have been diagnosed with COPD and it is estimated that a further 2 million remain undiagnosed. Incidence of COPD has risen from 1.7% to 1.9% of the population over the last 10 years. Chronic lower respiratory diseases were reported as the third most common cause of mortality in England and Wales in 2023 ([Office for National Statistics, 2023](#)). COPD is much more common in areas of high deprivation. People living in these areas have a lower life expectancy than the general population, and COPD is responsible for 8% of this difference in men and 12% in women. Managing COPD in the UK costs the NHS over £800 million a year.

4 Care pathway

[NICE's guideline for the diagnosis and management of COPD in over 16s](#) (NG115) states that COPD care should be delivered by a multidisciplinary

team that includes respiratory nurse specialists.

Self-management plans should include education and an individualised exacerbation action plan for people at risk of exacerbations. These plans should improve the confidence and knowledge for people with COPD. Treatments and plans including inhaler technique and onward referral for exercise interventions should be revisited at every review. People with COPD should be on the primary care COPD register and should attend a follow-up review in primary care at least once a year and more often if needed. The current model of delivery of these interventions is usually face-to-face interactions between individuals with COPD and specialist respiratory staff.

Standard care includes face-to-face monitoring through appointments, and self-management plans that are not digital. When people have exacerbations of their COPD symptoms, they generally present to their GP or emergency department. Following an assessment, they are either advised to self-manage at home, admitted to hospital, or referred to the community team for support in their own home.

People who have received in-hospital care after an exacerbation are given care bundles. Care bundles aim to help people cope better once home from hospital and potentially prevent further re-admission by improving outcomes. 75.5% of people with COPD exacerbations discharged from hospitals in England, Scotland and Wales between October 2019 and February 2020 received a discharge bundle according to the [NACAP COPD clinical audit](#). Despite these innovations, the readmission rate for COPD is rising in the UK. 23.9% of people with COPD were readmitted at least once within 30 days and 43.2% of people with COPD were readmitted at least once within 90 days of the discharge date according to the [NACAP COPD clinical audit](#). There is a need to support people to self-manage more effectively which may reduce the risk of the initial exacerbation and potentially reduce the likelihood of people being readmitted after their initial exacerbation.

Potential need for digital technologies for supported self-management of COPD in the care pathway

COPD affects around 3 million people in the UK. It has been identified that many people with COPD experiencing exacerbations are presenting to services for support and treatment. This is utilising NHS resources that could be allocated to other priority areas if these people are provided with the tools to self-manage their condition at home. Furthermore, as prevalence of COPD is rising, the burden on the system is increasing. There is a clinical opportunity to provide supported self-management resources for people with COPD.

There is a possibility that a digital technology enabling the following could improve outcomes for people with COPD through:

- Increased self-monitoring of symptoms
- Increased self-management of exacerbations
- Making personalised self-management plans available to more people with COPD
- Reduced hospitalisations via effective self-management
- Managing breathlessness efficiently at home
- Improved knowledge on effective COPD medication use and exercises to improve breathing
- Increased awareness of changes or deterioration of COPD status
- Increased medication adherence
- Reduced exacerbations or suspected exacerbations presenting at hospital, GP or community care service

Digital technologies could provide supported self-management via education (including around non-pulmonary rehabilitation exercise and smoking cessation), benchmarking and monitoring clinical parameters (self-monitoring but may include remote monitoring). Education is beneficial for all individuals with COPD. It is particularly crucial for them to understand their condition and take proactive measures to prevent its worsening and to prevent worsening health outcomes. Virtual wards providing an alternative to hospital care are not in the scope of this evaluation.

Clinical experts indicate that the greatest need is for digital technologies with a monitoring function where the person with moderate to severe COPD can monitor and manage their symptoms at home. This may include sensor-based technologies which are designed to empower people with COPD with an understanding of their own health status. This may also include people who have been discharged to monitor the person with COPD in the post discharge period, outside of a virtual ward setting, due to the high risk of readmission which impacts NHS resource use. Experts suggest that having the facility to record these parameters to identify triggers and patterns in the symptoms will also improve the self-management of COPD and may provide valuable insights to the person's clinical care team and can also be used as part of the annual review that people with COPD have with their clinical care team.

Also some technologies may allow remote monitoring which is the monitoring of a patient to allow a care professional or service to initiate an outpatient appointment when required to manage the patient's condition ([NHS Data Dictionary](#)). This may be useful for people who have been discharged post exacerbation, outside of a virtual ward setting, who are at a higher risk of

readmission. Experts state that reducing further exacerbations and readmissions may have a significant impact on resource use.

5 Patient issues and preferences

The [NHS RightCare Pathway: COPD](#) highlights the core components of an optimal service for people with COPD. It includes the importance of enhancing access to COPD services which help provide personalised holistic reviews, and signposting and self-management plans which may be provided by digital technologies. Using digital technologies for COPD supported self-management accessible through mobile devices or computers will allow people to engage from their homes which may be more convenient. These digital solutions are valuable for individuals facing challenges accessing in-person care due to limited services, extended waiting lists, or physical constraints. These digital technologies also may be preferred by people who are comfortable with technology, individuals who prefer remote healthcare access, and those who may be housebound due to health issues. By offering remote support and education, these digital technologies improve accessibility, empowering people to actively manage their COPD with ease and convenience.

Some people may choose not to use digital technologies and may prefer in-person clinician-led treatment if this is available to them. There may be some concerns about the level of support provided by digital technologies and concerns around data security and quality control. Some people may therefore prefer to have a hybrid approach and use digital supported technologies as an adjunct rather than as a replacement for usual care.

People should be supported by healthcare professionals to make informed decisions about their care, including the use of digital self-management technologies. Shared decision making should be supported so that people are fully involved throughout their care ([NICE's guideline for shared decision making](#)).

6 Comparator

The comparator for this assessment is standard care for adults with COPD. Standard care includes self-management without digital support which may include face-to-face monitoring and appointments.

7 Scope of the assessment

Table 1 Scope of the assessment

Populations	Adults with a confirmed diagnosis of COPD
Subgroups	If the evidence allows the following subgroup will be considered: People that have been discharged post-exacerbation (non-virtual ward use)
Interventions (proposed technologies)	Digital technologies for adults with COPD, which may include: <ul style="list-style-type: none"> • Active+me REMOTE • CliniTouch Vie • COPDhub • COPD Predict • Current Health • DOC@HOME • Lenus • Luscii • myCOPD • patientMpower • Space for COPD • Wellinks
Comparator	Standard care which could include: <ul style="list-style-type: none"> • Self-management without digital support (including face-to-face appointments and monitoring)
Healthcare setting	Community, primary or secondary care (excluding virtual ward use)
Outcomes	Intermediate measures for consideration may include: <ul style="list-style-type: none"> • Intervention adherence, rates of attrition (dropouts) and completion • Intervention-related adverse events • Inaccessibility to intervention (digital inequalities) Clinical outcomes for consideration may include: <ul style="list-style-type: none"> • Respiratory function (including but not limited to the COPD assessment test [CAT] score, the Modified British Medical Research Council [mMRC]) • Daily activity • Acute exacerbations • Hospital admissions, readmissions or emergency admissions • Outpatient clinic visits, GP visits • Additional medication required including steroids, antimicrobials

	<ul style="list-style-type: none"> • Optimising inhaler technique <p>Patient-reported outcomes for consideration may include:</p> <ul style="list-style-type: none"> • Health-related quality of life • Patient experience, usability and acceptability • Psychological wellbeing <p>Costs will be considered from an NHS and Person Social Services perspective. Costs for consideration may include:</p> <ul style="list-style-type: none"> • Cost of the technologies including device, license fees and staff training • Cost of other resource use (e.g. associated with managing COPD, exacerbations, suspected exacerbation hospital presentations, adverse events, or complications): <ul style="list-style-type: none"> ○ Healthcare appointments in primary, secondary and community care ○ Medication use and adverse events ○ Healthcare professional grade and time ○ Occupied bed days ○ Urgent care/accident and emergency attendances (for both true exacerbations and suspected exacerbations that do not meet the clinical definition of a COPD exacerbation)
Time horizon	<p>The time horizon for estimating the clinical and cost effectiveness should be sufficiently long to reflect any differences in costs or outcomes between the technologies being compared.</p> <ul style="list-style-type: none"> • 12 months (to account for seasonal variation) <p>If data allows, a 3-month time horizon could be suitable to capture differences in resource use for the subgroup of people that have been discharged post-exacerbation</p>

8 Other issues for consideration

Characteristics of digital technologies

There are a lot of varying features of digital technologies that can be used for supported self-management. Some digital technologies enhance COPD care by enabling self-monitoring to monitor vital signs by obtaining data from pulse oximeters and spirometers. These technologies may help early detection of exacerbations by changes in vital signs which can notify people with the condition and their care team. There may also be features where an

appointment can be booked or a consultation with a clinician can be conducted through the platform.

Digital technologies can also improve medication adherence by sending reminders or accessing data from devices. Technologies can also provide access to educational resources and signposting services. The technologies may use data analytics to identify trends and patterns in a patient's condition. This can help healthcare teams make informed decisions about treatment adjustments and provide personalised care. These capabilities contribute to more effective COPD self-management and better patient outcomes.

9 Potential equality issues

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others. Age, sex, disability, race, and religion or belief are protected characteristics under the Equality Act 2010.

COPD is most common in people over 50. Men tend to be at higher risk of developing COPD than women. There is a higher prevalence of respiratory diseases in people from a lower socioeconomic background due to poorer living conditions and higher rates of smoking. People living in more disadvantaged areas also have a lower life expectancy than the general population. COPD is responsible for 8% of this difference in men and for 12% of this difference in women.

Digital technologies for supported self-management are accessed via a mobile phone, tablet, or computer. They may also need to synchronise with other devices such as oximeters. Some people may prefer to use the devices such as inhalers that they are familiar with. Regular access to a device with internet access is needed to use the technologies, but some people may not have access to this. Some people may prefer to use non-digital methods for supported self-management of COPD. Additional support and resources may therefore be needed for people who are unfamiliar with digital technologies or people who do not have access to smart devices or the internet.

Some people with visual impairment or learning disabilities may find using digital technologies helpful for example if data is uploaded automatically by smart devices when self-monitoring which could improve data accuracy and improve their care. People with a visual, hearing, or cognitive impairment, problems with manual dexterity, a learning disability, or who are unable to read or understand health-related information (including people who cannot read English) or neurodivergent people may need additional support to use digital programmes.

Some people would benefit from digital supported self-management technologies in languages other than English. People's ethnic, religious, and cultural background may affect their views of digital technologies for supported self-management. Healthcare professionals should discuss the language and cultural content of digitally-enabled programmes with patients before use.

10 Potential implementation issues

Equity of access

Digital technologies for supported self-management may not be suitable for some people. COPD is most common in people over 50 and there is a higher prevalence of respiratory diseases in people from a lower socioeconomic background. Some people may be less comfortable or skilled at using digital technologies or may not have access to appropriate equipment or internet, and may prefer another treatment option. Some people may prefer to use digital technologies due to difficulties getting to in-person appointments, for example if they do not have access to a car and have poor public transport.

Capacity limitations

Implementation of digital supported self-management technologies may initially increase staff workload to set up new pathways and become familiar with new systems. Sharing of information from devices would be beneficial so ideally there should be interoperability between different patient management systems, which is not likely as primary care and secondary care have different systems. If remote monitoring data is being shared with care providers this may increase the burden on staff. It will be important to ensure that the level of monitoring is appropriate according to clinical need. Staff may need to spend additional time attending training courses or watching training videos. Additional time may also be needed for staff to train patients to use the digital technologies. Some companies may offer patient training, while some may expect local NHS staff to provide this to patients.

If digital supported self-management technologies are used as an adjunct rather than as a replacement to usual care which is self-management without digital support, there is a risk that there will be no reduction in clinician appointments and may increase the amount of GP or clinic visits. This may be more likely if there is more remote monitoring required or if the technologies have a lower threshold in terms of clinical risk to signal the user to contact their care provider. This will also impact the costs.

Costs

Costs of technologies may differ. Implementation of digital supported self-management technologies may initially increase costs to set up new pathways and change service delivery. Smaller service areas including rural areas may have higher costs per user due to not needing as many licences for the technology and they may not realise the same benefits compared to larger more populated areas. Digital technologies may be chosen based on the balance between costs and expected outcomes.

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