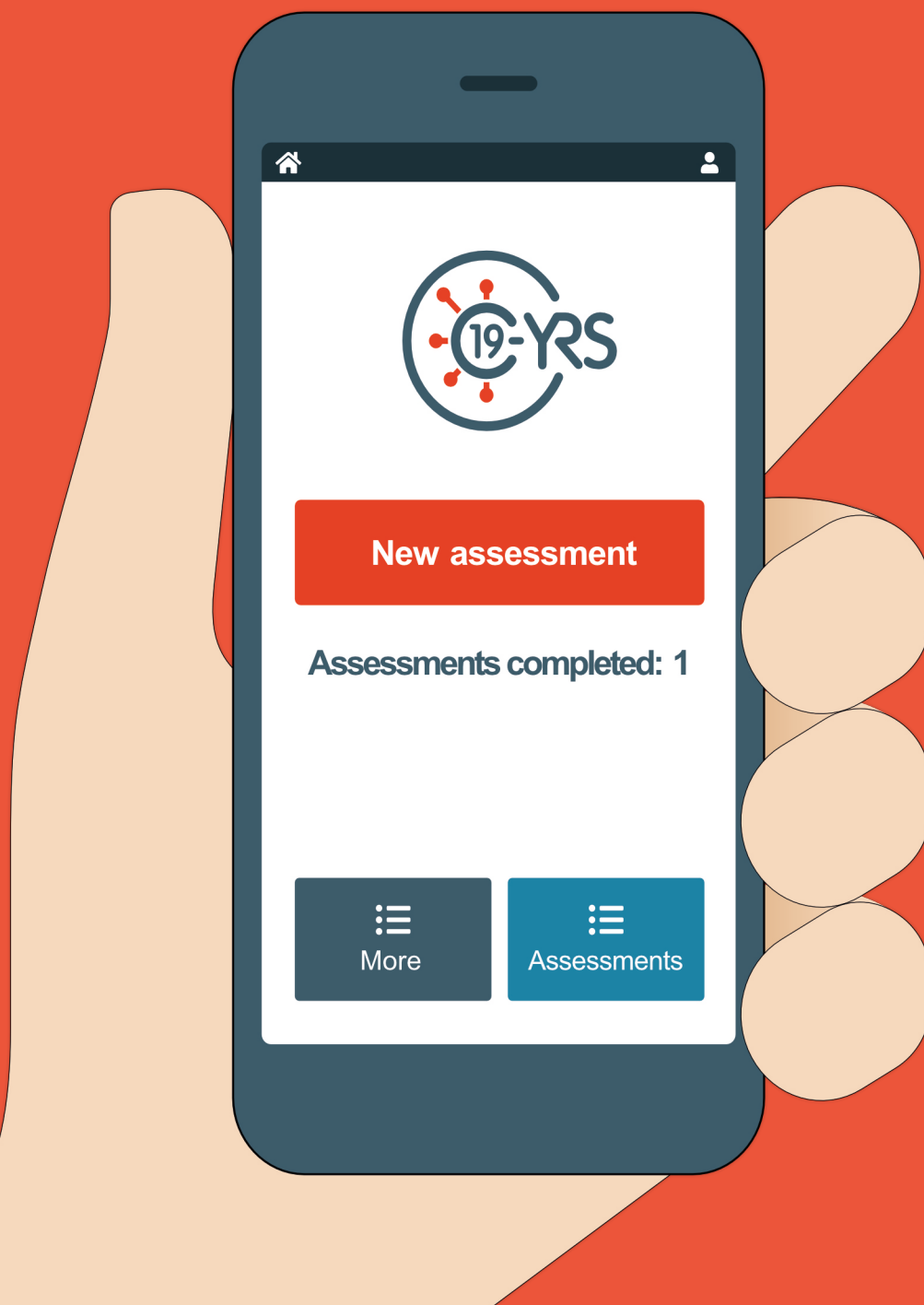


C19-YRS

COVID-19 Yorkshire Rehabilitation Scale

A complete and customisable digital solution for the design, delivery, and management of clinical research studies into long-term conditions.



Contents

Background

The COVID-19 Yorkshire Rehabilitation Scale.....	3
The Team.....	4
The App.....	5

C19-YRS for Research.....	7
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Features

The Portal.....	8
The App.....	9

Benefits

For Researchers.....	10
For Participants.....	10

Our expertise in research

ELAROS' network.....	11
Live projects.....	11
Previous projects.....	12
Addressing the needs of pharma companies.....	12

Clinical assurance

NHS DSPT certification.....	13
CyberEssentials Plus certification.....	13
ORCHA certification.....	13
NCA Clinical Safety Case report.....	13
C19-YRS validation.....	13

Contents

Awards

AHSN Network x NHS Confederation Innovate Award.....	14
BMJ Clinical Leadership Team of the Year Award.....	14
Medipex Innovation Awards.....	15
NIHR Study.....	15
Partners and Support.....	16
C19-YRS Roadmap.....	18



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Background: C19-YRS

The COVID-19 Yorkshire Rehabilitation Scale

The COVID-19 Yorkshire Rehabilitation Scale (C19-YRS) is the world's first clinically validated outcome measure used to capture persistent symptoms of 'long COVID' or 'post-COVID syndrome'.

Originally developed as a telephone screening tool by multi-disciplinary teams from Leeds, Airedale, and Hull NHS Trusts to assess and capture symptoms and guide rehabilitation interventions by covering all components of the WHO ICF Framework, the C19-YRS has been developed into a digital platform by the digital health company, ELAROS which is offered to all NHS and public-health organisations on a not for profit basis.

The platform has been developed collaboratively with clinical research teams and patients to support long Covid services with the remote assessment, triage, monitoring, management, and rehabilitation of patients via a clinical web portal and a scalable patient-facing app.

C19-YRS is recognised internationally and has been adopted globally, forming part of national strategies and guidelines in NHS England, NHS Scotland, Canada, Chile, and afar. The digital C19-YRS has been used to support 10,000 patients across 60 NHS Trusts and Health Boards since its public launch in June 2021.

The system has since been developed further to pivot towards supporting clinical research projects on long Covid and other long-term conditions, such as COPD. Research teams of varying size are able to configure the platform's features based on a study's protocol, desired duration and participant information.

Background: The Team

The C19-YRS Research Team

The original C19-YRS self-report was developed by multi-disciplinary rehabilitation teams from The University of Leeds and Leeds, Airedale, and Hull NHS Trusts to assess and capture symptoms and guide rehabilitation interventions for patients with post-COVID syndrome.

The core team has been supported by research-active clinicians across the UK and internationally to share findings and gather feedback in order to rapidly develop the C19-YRS which has become the gold standard tool for assessing the complex mix of persistent symptoms experienced by patients due to COVID-19.

Details on the team can be found at: c19-yrs.com/covid-rehab-team/

ELAROS 24/7 Ltd.

ELAROS is a UK-based private digital health company with 4 of its own NHS shareholders. The company brings together industry, the academic community, and the NHS to develop cutting-edge innovations into successful, clinically useful products through a partnership approach.

ELAROS has partnered with The University of Leeds to digitise and enhance the C19-YRS by developing a clinical web portal and patient app, together with its strategic technology partners, Pipe and Piper Ltd.

The NHS organisations involved in ELAROS are:

- Devices for Dignity: a NIHR Healthcare Technology Co-operative hosted by Sheffield Teaching Hospitals NHS Foundation Trust
- Sheffield Teaching Hospital NHS Foundation Trust
- Medipex Ltd and NHS Innovations North
- North Tyneside Clinical Commissioning Group

More information on ELAROS can be found at elaros.com

Background: The App

Created by clinical academics

C19-YRS was the first clinically validated outcome measure for Long COVID, developed by the University of Leeds through clinical research across the UK

Developed with NHS Trusts

The digital C19-YRS has been developed collaboratively with support from the Leeds Community Healthcare, Leeds Teaching Hospitals, Airedale, and Northern Care Alliance NHS Trusts

Pioneered by Global Digital Exemplar NHS Sites

The digital C19-YRS has been adopted and pioneered by Salford Royal and Liverpool University Hospitals NHS Trusts, providing invaluable input to the system's development

Enhanced by industry experts

The digital C19-YRS has been developed by ELAROS and its technology partner, Pipe and Piper Ltd, building on their CE-marked medical device, the Digital Bladder Diary

Recommended by NHS England and NHS Scotland, recognised by NICE, endorsed by the BSRM

NHS England has recommended routine use of the C19-YRS at first assessment, 6 weeks, and 6 months in clinics in their National guidance for post-covid syndrome assessment clinics

NHS Scotland has adopted the platform nationally for all Health Boards across the country

NICE has recommended validation of the C19-YRS in their COVID-19 rapid guideline which is now complete

The C19-YRS has also been endorsed by the British Society for Rehabilitation Medicine, and features in several national guidelines as far as Canada and Chile

Funded by the National Institute for Health Research

The C19-YRS is being used to deliver a multinational £3.4 million clinical research project led by The University of Leeds, which include 8 UK Universities, 10 NHS sites, and ELAROS

Background: The App

Assurance

- ✔ Offered on a not-for-profit basis to the NHS and all public health organisations
- ✔ DSPT certified
- ✔ CyberEssentials and Cyber Essentials Plus Certified
- ✔ ORCHA certified
- ✔ Licence includes free access to future system updates
- ✔ DTAC complete
- ✔ ELAROS' platform is the only digital system offering all the NHSE recommended tools; the C19-YRS and EQ-5D-5L
- ✔ C19-YRS has been clinically validated with LC patients, with results published in the Journal of Medical Virology

Award Winning

- ✔ Winners of the AHSN Network x NHS Confederation Innovate Awards 2022
- ✔ Winners of the 2021 BMJ Clinical Team of the Year Award
- ✔ Winners of Medipex Ltd's NHS Innovation Awards 2021
- ✔ Funded by the NIHR to deliver a multi-national LOCOMOTION project with 8 UK Universities and 11 clinical sites

Established

- ✔ Adopted nationally by NHS Scotland, and across England and Wales since June 2021.
- ✔ Recommended for routine use by NHS England, NHS Scotland, NICE, Ontario Health, Chile's Ministry of Health and more.
- ✔ The original C19-YRS self-report is used globally and is heavily cited in the literature.
- ✔ Pioneered by The University of Leeds and other leading academic and clinical organisations

World Leading

- ✔ The world's first clinically validated outcome measure for use in long COVID patients
- ✔ The C19-YRS self-report is used worldwide
- ✔ Modified C19-YRS features in the World Health Organisation's 'Support for Rehabilitation Self-Management after COVID-19-Related Illness' resource
- ✔ Used to drive world leading R&D in Universities and clinics, globally

C19-YRS for Research

Features

- ✓ Set up multiple large-scale, multi-site research projects to run separate or concurrently to clinical practice
- ✓ Customisable PROMs according to protocol
- ✓ Continuous, longitudinal data capture
- ✓ Automatic reminders for completion
- ✓ Configurable e-consenting process
- ✓ Automatic pseudonymisation of data based on participant consent
- ✓ Access to PIS and study material within the app
- ✓ Direct anonymous communication with participants
- ✓ Interactive reporting tools to analyse different demographic groups and compare cohorts

Benefits

- ✓ Research staff time reduced by up to 90%
- ✓ Improved compliance and adherence to study protocol
- ✓ C19-YRS heavily cited in the literature for comparison
- ✓ Numerous configurability options
- ✓ Simple, easy to use interface
- ✓ Automatic filtering of participants that give consent
- ✓ Can run concurrent to clinical practice
- ✓ Time saving in recording consent manually
- ✓ Compliance with necessary data protection and ethical requirements



Innovate
UK



NIHR | National Institute
for Health Research



UNIVERSITY OF LEEDS

Features: The Portal

The Web Portal:

Digital C19-YRS offers an online web portal for research organisations to manage their study cohort across one or more localities.

From here, staff can set up new participants, configure different PROMs, view results, and access powerful reporting tools for the individual participant, the overall cohort, or a pre-defined group of users.

Reports are automatically generated which can be exported for external storage.

The system is hosted in the cloud, meaning no installation is required.

Pseudonymised data can also be viewed by staff with lower access rights

- ✔ Secure individual logins staff members
- ✔ Comprehensive set of PROMs available to configure for different participants and groups
- ✔ Upload assessments retrospectively to add historic data
- ✔ Edit assessments, with tracked changes and version control
- ✔ Easily interpret graphs to understand changes in health
- ✔ Download assessment reports as PDF files
- ✔ Download raw participant cohort data for external analysis
- ✔ Automatic audit log generation
- ✔ Data is linked to participant app in real time

NHS Number	Name	Age (D.O.B)	Ethnicity	Gender	Questionnaires	Centre	Locality	Sharing Data	Enabled	Added
010-000-0000	Anderson, Alexander	62 (1st Jan, 1960)	-	Male	0	Elaros Demo Centre	Demio Locality	X	✓	14th Jan, 2022
020-000-0000	Byron, Bethany	60 (2nd Feb, 1961)	-	Female	0	Elaros Demo Centre	Demio Locality	X	✓	14th Jan, 2022
030-000-0000	Cornell, Christopher	59 (3rd Mar, 1962)	-	Male	0	Elaros Demo Centre	Demio Locality	X	✓	14th Jan, 2022
040-000-0000	Dorset, Diana	58 (4th Apr, 1963)	-	Female	0	Elaros Demo Centre	Demio Locality	X	✓	14th Jan, 2022
050-000-0000	Evans, Edward	57 (5th May, 1964)	-	Male	0	Elaros Demo Centre	Demio Locality	X	✓	14th Jan, 2022

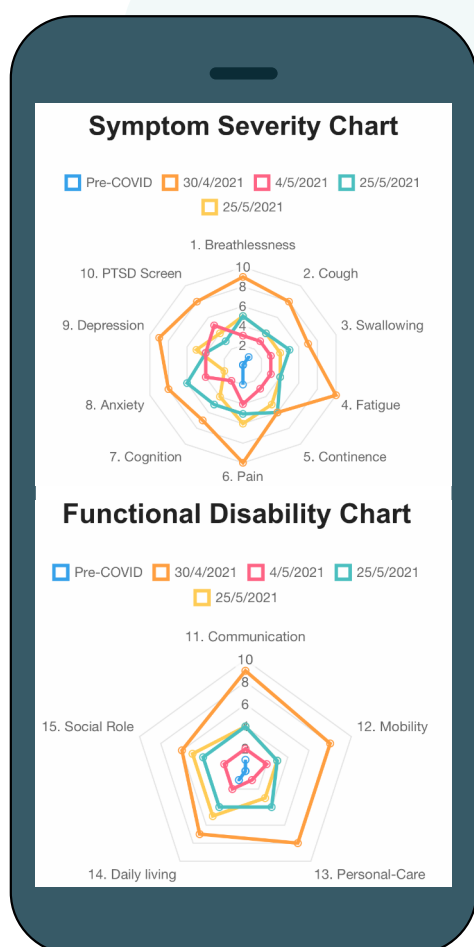
Participant list view

Features: The App

The Participant App:

Participants have access to their own dedicated profile on mobile or online via our web app, meaning even those without personal devices can access the C19-YRS online; independently, with a carer, or family member as part of a telephone appointment.

Participants can use the app to complete assessments, track progress and follow study protocols.



Mobile view of
C19-YRS Scores

- ✓ Access to clinically validated PROMs for long Covid
- ✓ Access to other common PROMs and PREMs prescribed by clinics, including the EQ-5D-5L, PHQ9, GAD7, FFT and more
- ✓ Adapted Autonomic Profile (aAP) Diary for dysautonomia
- ✓ Access to relevant support resources related to study or clinical practice if running concurrent to the study
- ✓ Dedicated profiles for participants
- ✓ Unique, secure login
- ✓ Available on mobile
- ✓ Available online via a web app on tablet or desktop for those without access to mobile
- ✓ Accessible by staff to complete with participants via telephone
- ✓ Complete assessments independently, with a carer, or with staff in a telephone appointment
- ✓ View assessment history and track progress over time
- ✓ Simple, yet insightful graphs to understand changes in symptom severity
- ✓ Goal setting and e-diaries
- ✓ Configurable automatic reminders

Benefits

For Researchers

- ✓ Administrative time on postage, printing, scanning reduced
- ✓ Research staff time reduced by up to 90%
- ✓ Continuous, enhanced, accelerated data analysis, auditing and evaluation
- ✓ Digitally streamlined research processes
- ✓ Adaptable user experience to align with study protocol
- ✓ Flexible to meet the needs of different clinics and participants
- ✓ Helps capture information remotely without the need for staff input
- ✓ Improved compliance and adherence to protocol
- ✓ Less errors and withdrawals
- ✓ Automatically generate reports for individual participants or study cohort
- ✓ Continuous system development and unlimited staff support from ELAROS
- ✓ Long term data capture
- ✓ Automatically recorded audit trail
- ✓ Auto-anonymisation based on participant consent

For Participants

- ✓ Personal, interactive profile
- ✓ More reliable than a paper diary
- ✓ Time saved compared with paper tools and telephone interviews
- ✓ Improved compliance and adherence to protocol
- ✓ Greater satisfaction, less stress
- ✓ Stay informed and motivated during the study
- ✓ Ongoing, direct communication with researchers when needed
- ✓ Automated and discrete capture and assessment of information
- ✓ Can be completed anytime, anywhere
- ✓ Sustainable participant monitoring without the need to travel or take lengthy calls
- ✓ Straightforward, easy-to-use system at a convenient time

Our expertise in research

ELAROS is working with a growing global network comprised of:

- 40 Universities in the UK and internationally in Italy, Japan, Thailand, The USA, Australia, and more
- 50 clinically active NHS Trusts and CCGs in England
- 22 clinically active NHS Health Boards in Scotland
- Public Health organisations at NHS England and NHS Scotland
- The National Institute for Health Research and NIHR Children and Young People MedTech Co-operative
- UKRI Innovate UK
- The Sleep Charity (UK)
- World Health Organisation
- The Medicines Evaluation Unit (UK) research facility

Plus many more clinical, academic, and industry partners working in:

- ✓ Asthma
- ✓ Breast cancer
- ✓ Children's and adult sleep
- ✓ Chronic fatigue
- ✓ Chronic pain
- ✓ Respiratory illness
- ✓ Clinical trials management
- ✓ Hydration
- ✓ Long COVID
- ✓ Service improvement management
- ✓ Stroke assessment and management
- ✓ Ultrawideband technology
- ✓ Urology

Live research projects:

- MammoScreen: Innovative and safe microwave-based imaging technology to make breast cancer screening more accurate, inclusive and female-friendly (EU Horizon 2020)
- Neu-Restore (Innovate UK)
- NHS England National service evaluation
- ROVER RISE: Reliable Technologies and Models for Verified Wireless Body-centric Transmission and Localisation (EU Horizon 2020)
- UK-wide LOCOMOTION study on long Covid (NIHR)
- UNICO: Understanding chronic pain in long covid (University of Leeds)

Our expertise in research

Previous research projects

- The Digital Bladder Diary: Reducing unnecessary referrals to secondary care and empowering Gps to make clinical decisions closer to the patient (Innovate UK)
- Sleepy Fox: Development of a digital platform for the assessment and improvement of children's sleep (SBRI UK)
- The development of a digital Dysphagia Guide with care homes (Innovate UK)
- The development of a digital hydration management platform for care homes (University of West London)
- And much more

Addressing the needs of researchers and pharmaceutical companies through Mi-Trial Limited

- ELAROS has an established joint venture with The University of Manchester, and the Manchester CRO, Medicines Evaluations Unit, to develop Mi-Trial; a comprehensive platform designed to meet the needs of both trial participants and those managing trials.
- The portal and app were developed by experts in clinical trials design and delivery, working closely with UI/UX developers, to combine and deliver the flexibility and function required for complex trials at any scale.
- By improving the trials experience and protocol adherence for participants, this reduces participant errors and wastage, saving time and resource for both trial centres and sponsors.
- For more information visit mi-trial.com or contact henry.robinson@elaros.com



The University of Manchester



medicines
evaluation unit

Clinical Assurance

NHS DSPT Certification

ELAROS has met all requirements of the NHS Data Security and Protection Toolkit which ensures both ELAROS and the C19-YRS system is compliant with the National Data Guardian's extensive set of security standards.

CyberEssentials Plus

ELAROS has obtained its CyberEssentials Plus certificate, following a successful audit from a third party cyber security company. This certification is backed by the UK government and overseen by the National Cyber Security Centre, providing technical assurance on the company's cyber security defences and rigour.

C19-YRS Validation

C19-YRS has been validated as an outcome measure in an observational study of 187 consecutive patients within the Leeds city region which evaluates the psychometric properties of the scale. The study was published in the Journal of Medical Virology and demonstrates the clinical applicability and suitability in determining the relationships between overall perception of health and reports of symptoms, functioning, and disability.

ORCHA Certification

Both the app and web versions of the app have undergone the ORCHA review process, passing and scoring highly with 74% and 72% respectively. This is an internationally-recognised, in-depth and broad review which evaluates digital health technologies on their ability to meet standards and regulations set by governance departments in the UK and worldwide. The review covers clinical safety, data protection, technical assurance, interoperability, accessibility and usability among other properties.

Independent Clinical Safety Case Report from the Northern Care Alliance NHS Trust

The C19-YRS underwent an independent clinical safety case study review with the Northern Care Alliance NHS trust to ensure the system was safe to implement the system across Bury, Oldham, Rochdale, and Salford which was approved by 14 members of staff at the Trust and local CCGs.



Awards

AHSN Network Innovate Awards 2022

ELAROS, Leeds Community Healthcare, and Leeds Teaching Hospitals NHS Trust were joint winners of the ‘Outstanding Collaboration with Industry’ Award at the national AHSN Network and NHS Confederation Innovate Awards. The award was for work on “The world’s first validated digital system for the initial assessment, triage, management, monitoring, and rehabilitation of patients with Long COVID”.



BMJ Clinical Leadership Team of the Year Award 2021

The Leeds Long Covid Rehab Service, provided by Leeds Community Healthcare and Leeds Teaching Hospitals NHS Trusts, were awarded the 2021 BMJ Clinical Leadership Team of the Year Award for their work in:

Developing the Yorkshire Rehabilitation Scale which is used globally

Forming the UK’s first dedicated long Covid pathway, setting a benchmark for the rest of the UK

Developing the digital C19-YRS scalable platform with ELAROS which has been adopted across the UK and has been used as part of Leeds’ novel rehabilitation pathway.

The award recognises a team that exemplifies the qualities of clinical leadership, requiring ideas and enthusiasm and often by doing things differently.



Awards

Medipex Ltd. NHS Innovation Awards 2021

ELAROS and The University of Leeds, and Leeds Community Healthcare and Leeds Teaching Hospitals NHS Trusts were joint winners at Medipex Ltd's Innovation Awards in its Management of Long Term Conditions category. These awards celebrate leading innovations developed across the Yorkshire region and were selected by judges from Medipex, Medovate and the Yorkshire and Humber AHSN.



NIHR: LOCOMOTION study

The University of Leeds are recipients of a £3.4 million multi-national research study on long Covid which includes 8 UK Universities and 10 NHS sites, with ELAROS named as its technology partner. The digital C19-YRS system is central to the project and will accelerate the remote collection of patient data collection from 3 British nations.

FUNDED BY

NIHR | National Institute
for Health Research

Partners and Support

Since its launch in June 2021, ELAROS' platform has been used by patients and staff across the following organisations:

Airedale NHS Foundation Trust
Bradford District Care NHS Trust
Bradford Teaching Hospitals NHS Trust
Blackpool Teaching Hospitals NHS Trust
Birmingham Community Healthcare NHS Foundation Trust
Calderdale and Huddersfield NHS Trust
Cambridge & Peterborough NHS Trust
Cambridge University Hospitals NHS Trust
Cardiff and Vale University Health Board
Cheshire and Wirral Partnership NHS Trust
East Cheshire NHS Trust
East Lancashire Hospitals NHS Trust
East Suffolk and North Essex NHS Trust
Essex Partnership University NHS Trust
HCRG Care Group
Hertfordshire Community NHS Trust
Lancashire & South Cumbria NHS Trust
Leeds Community Healthcare NHS Trust
Leeds Teaching Hospitals NHS Trust
University Hospitals of Leicester NHS Trust
Liverpool University Hospitals NHS Trust
Mid Cheshire Hospitals NHS Trust
Mid-Yorkshire Hospitals NHS Trust

Newcastle Hospitals NHS Trust
North West Anglia NHS Trust
NHS Ayrshire and Arran Health Board
NHS Borders Health Board
NHS Dumfries and Galloway Health Board
NHS Fife Health Board
NHS Forth Valley
NHS Grampian Health Board
NHS Greater Glasgow and Clyde
NHS Highland Health Board
NHS Lanarkshire Health Board
NHS Orkney Health Board
NHS Shetland Health Board
NHS Tayside Health Board
NHS Western Isles Health Board
Northern Care Alliance NHS Trust
Pennine Acute Hospitals NHS Trust
Provide CIC Essex
Rotherham, Doncaster, and South Humber NHS Trust
Salford Royal NHS Trust
Stockport NHS Foundation Trust
South West Yorkshire Partnership NHS Foundation Trust
Sussex Community NHS Trust
University of Morecambe Bay NHS Trust
West Suffolk NHS Trust
Wiltshire Health and Care

Partners and Support

With support from:

- ✓ ACNR - Advances in Clinical Neuroscience and Rehabilitation
- ✓ Act as One - Bradford District and Craven CCG
- ✓ Barnsley CCG
- ✓ Bath and North East Somerset, Swindon and Wiltshire CCG
- ✓ BMJ - British Medical Journal
- ✓ The British Society for Rehabilitation Medicine
- ✓ Cheshire CCG
- ✓ Innovate UK
- ✓ The Journal of Rehabilitation Medicine
- ✓ Lancashire & South Cumbria ICS
- ✓ Medipex Ltd
- ✓ National Institute for Health Research
- ✓ NHS England and NHS Improvement
- ✓ NHS Scotland
- ✓ NICE
- ✓ ORCHA
- ✓ RTC North
- ✓ Suffolk and North East Essex ICB
- ✓ Yorkshire & Humber AHSN

Universities:

- ✓ The University of Leeds
- ✓ Imperial College London (LOCOMOTION)
- ✓ King's College London (LOCOMOTION)
- ✓ The University of Oxford (LOCOMOTION)
- ✓ Oxford Brookes University (LOCOMOTION)
- ✓ The University of Manchester (LOCOMOTION)
- ✓ University of Dundee (LOCOMOTION)
- ✓ University of Leicester (LOCOMOTION)
- ✓ Aston University

C19-YRS roadmap

1. March 2020: Meta-analysis of long-term outcomes in previous coronavirus outbreaks. (Hassaan et al JRM 2020.)

The research team performed a systematic review and meta-analysis of long-term clinical outcomes in those affected by SARS (2002) and MERS (2012) and found more than one-third of survivors suffered persistent symptoms of psychological problems, exercise intolerance, fatigue, compromised lung function and reduced quality of life even at 12 months after discharge. This prompted us to capture longer-term problems in COVID-19.

2. April 2020: Development of telephone version of C19-YRS. (Sivan et al ACNR 2020.)

A multidisciplinary team of rehabilitation professionals came together to tackle this important issue of following up COVID-19 patients after hospital discharge. As face-face appointments were deemed risky, there was a need for virtual assessment of these patients. A telephone screening scale was developed based on staff experience of managing these patients and knowledge from our systematic review of previous outbreaks. A consensus method was used to decide on the final questions of C19-YRS.

The scale was kept balanced in terms of questions spanning all aspects of the 2001 WHO International Classification of Functioning, Disability and Health (ICF) framework.

3. May - June 2020: Leeds COVID-19 follow-up study. (Halpin et al 2020.)

The research team conducted the UK's first COVID-19 follow-up study studying 100 patients discharged from hospital and used a version of the C19-YRS scale to capture symptoms and rehabilitation needs.

This study proved the content validity of the scale that it captured and measured persistent symptoms reported in other studies. Fatigue, breathlessness, psychological symptoms, pain and cognitive problems were the most common problems at 7 weeks after hospital discharge. This syndrome has since been named as Long COVID or post-COVID syndrome.

4. July - August 2020: Leeds Integrated rehabilitation pathway. (Sivan et al 2020.)

The findings of the above study helped inform Leeds commissioners to invest in setting up a dedicated COVID follow-up service.

C19-YRS roadmap

This was the UK's first dedicated specialist multidisciplinary rehabilitation service and is currently the benchmark service for other UK centres setting up their services. C19-YRS is the core measure used in the service for triage, deciding interventions and monitoring of patients with Long COVID.

5. October - November 2020: NHS England Clinical Guidance and NICE guidelines.

NHS England invests £20m in setting up 40 centres to assess and manage individuals with Long COVID. The Clinical Guidance recommends the use of C19-YRS as an outcome measure to be used at first assessment, 6 weeks and 6 months to monitor progress. NICE guidelines suggest using C19-YRS as part of the comprehensive assessment of the individuals with Long COVID. NICE has suggested further validation and development of the scale.

6. December 2020: Digital self-report version of C19-YRS.

Based on the feedback received from all centres in the country currently using the scale, a self-report version has been developed with some modifications made to yield a symptoms severity score and functional disability score.

Additional symptoms have also been added based on the emerging evidence on symptoms of Long COVID. Elaros teamed up with the research team to develop a digital version of the scale that provides a smartphone application for end-users and a clinical web portal for healthcare professionals to manage patients. These tools can be used in routine care provided to these individuals in Long COVID centres. Data collected by the digital version will also be used for further validation and psychometric evaluation of the scale.

7. December 2020: Early findings from the Office for National Statistics.

The Office for National Statistics (ONS) published an initial set of early experimental results on the prevalence of Long COVID. The COVID-19 Infection Survey is a nationally- representative sample of the UK community population, which estimated that:

- Around 1 in 5 respondents testing positive for COVID-19 have persistent symptoms for 5 weeks or longer
- Around 1 in 10 respondents testing positive for COVID-19 have persistent symptoms for 12 weeks or longer.

C19-YRS roadmap

8. February - March 2021: Other NHS Trusts learn about the development of Elaros' app and contribute clinical expertise to accelerate the launch.

Salford Royal and Liverpool University Teaching Hospitals, 2 NHS Trusts recognised as 'Global Digital Exemplars', alongside Pennine Acute Hospitals, Airedale NHSTrust (with Bradford NHS Trusts), and the wider Cheshire & Merseyside Health & Care Partnership learn about the digital system being developed before it is launched.

Elaros continues the development of their platform using clinical and academic expertise with direct feedback from patient focus groups, which helps to prepare the system to a robust version that is suitable for the NHS.

9. April 2021: Elaros' digital C19-YRS is named in NHS England's National guidance for post-COVID syndrome assessment clinics (Version 2).

NHS England publishes the updated version of their National guidance for post-COVID syndrome assessment clinics which recommend that clinics continue to use the C19-YRS as well as the EQ-5D. The guidance references Elaros' system on page 32.

10. June 2021: Elaros' digital C19-YRS goes live at the first NHS clinical sites.

Salford Royal, Leeds Community Healthcare, Liverpool University Hospitals, Airedale, and Pennine Acute Hospitals NHS Trusts are the first clinics in the country to launch the digital C19-YRS who are recognised as the pioneers of the system.

11. July 2021: The University of Leeds is awarded a £3.4 million NIHR project.

The National Institute for Health Research (NIHR) awards a £3.4 million research project to The University of Leeds, alongside The University of Oxford, Imperial College London, The University of Manchester, and Elaros. The project includes 8 UK Universities and 10 clinical sites which will see the C19-YRS implemented into 10 clinical sites across all 4 nations of the UK to quickly gather patient data to learn more about the condition.

12. September 2021: ELAROS and Leeds Teaching Hospitals NHS Foundation Trust are winners at the Medipex NHS Innovation Awards.

C19-YRS roadmap

Elaros and its joint applicant partner, Leeds Teaching Hospitals NHS Foundation Trust, are joint winners in Medipex's NHS Innovation Awards in the 'Management of Long Term Conditions' category. The other winner was the Leeds Long COVID team for the rapid development of their treatment pathway.

13. September 2021: The World Health Organisation publishes its self-management resource for Long COVID with the modified YRS scale.

The World Health Organisation publishes its 'Support for Rehabilitation Self-Management after COVID-19-Related Illness' which includes basic exercises and advice for patients. The PDF includes the modified version of the C19-YRS scale which was developed by The University of Leeds COVID research team led by Manoj Sivan who is an advisor to the World Health Organisation for Long COVID.

14. September 2021: Leeds Long COVID Rehab Team with the BMJ Clinical Leadership of the Year 2021

On Wednesday, 29th September the Leeds Long COVID Rehab Service, provided by Leeds Community Healthcare and Leeds Teaching Hospitals NHS Trusts, is awarded the 2021 BMJ Clinical Leadership Team of the Year

award for the first dedicated multidisciplinary service for Long COVID and their follow-on work in developing the scalable, digital C19-YRWS platform with ELAROS.

15. October 2021: Elaros builds significant features into the digital platform.

The EQ-5D-5L and Modified C19-YRS, amongst 20 other PROMs are built into the platform, making Elaros the only digital provider of both NHSE recommended PROMs.

Other features include national reporting tools and customisable consent functionality to support multiple research studies within the platform.

16. November 2021: Elaros C19-YRS live at 8 new clinical research sites across the UK.

Elaros launches the C19-YRS platform at 8 new clinical research sites in Belfast, Birmingham, Cardiff, Leicester, London, Newcastle, Oxford, Tayside, as part of the NIHR funded LOCOMOTION project.

C19-YRS roadmap

17. May 2022: University of Leeds develop Modified C19-YRS with RASCH analysis (Sivan et al JRM 2022)

Based on the data collected from 370 patients who completed the C19-YRS, RASCH framework was used to assess the Symptom Severity and Functional Disability subscales. These Psychometric results and implications were related back to the working group of patients and healthcare professionals to receive feedback. A combination of this feedback and the emerging evidence on additional Long COVID symptoms allowed for a modified version of the C19-YRS scale to be developed. Future studies including the NIHR funded LOCOMOTION study will undertake large-scale, multi-centre validation of the modified C19-YRS.

18. July 2022: New NHS England Guidance recommending C19-YRS system and ELAROS 24/7

NHS England publish their July 2022 guidance for Long COVID services and recommends that clinics use ELAROS' digital C19-YRS platform for the collection of outcome measures as part of their service, and specifically that clinics use the C19-YRS outcome

measure. The exact guidance can be found in 'The NHS plan for improving Long COVID services' and 'National commissioning guidance for post COVID services' documents.

19. July 2022: Elaros digital C19-YRS goes live in Scotland

NHS Highland is the first Health Board in Scotland to adopt the digital C19-YRS to triage patients and continually monitor their condition, whilst conversations at a national level progress.

20. August 2022: Leeds adapted Autonomic Profile test help diagnose autonomic dysfunction in Long COVID patients (Sivan et al ACNR 2022)

Clinicians and researchers at the University of Leeds develop Autonomic Profile (aAP) test to help evaluate autonomic dysfunction, an increasingly recognised complication in Long COVID. The aim of the test is to help the individual and healthcare professional to understand links between symptoms and common triggers in daily life, inform self-management of Long COVID and help to explain Post-Exertion Malaise (PEM).

C19-YRS roadmap

21. September 2022: Elaros and Leeds NHS Trusts are winners at the AHSN Network Innovate Awards

ELAROS and its joint applicant partner, Leeds Teaching Hospitals NHS Foundation Trust, are winners in the 'Outstanding Collaboration with Industry' category at the national AHSN and NHS Confederation Innovate Awards for their work on 'The world's first validated digital system for the initial assessment, triage, management, monitoring and rehabilitation of patients with Long COVID.

22. December 2022: Leeds develop novel Pacing Protocol as a rehabilitation intervention for Long COVID (Parker et al JRM 2022)

Leeds set out to investigate the effects of the WHO's 6-week CR-10 pacing protocol on post-exertional symptom exacerbation (PESE) using a novel PESE questionnaire, and quality of life (QoL) of individuals with post-COVID syndrome (PCS). The structured pacing protocol was found to significantly reduce PESE episodes, increase activity levels and improve overall health, demonstrating the potential of Leeds' novel protocol. Results are published in the Journal of Medical Virology, December 2022.

23. January 2023: Lancashire & South Cumbria ICB adopt C19-YRS across the North West

Lancashire & South Cumbria ICB approve and begin implementation of Elaros' digital platform across its 5 PCS services in East Lancashire, Central Lancashire, West Lancashire, Fylde Coast, and Pennine Lancashire.

24. January 2023: Lanarkshire NHS Trust second in Scotland to adopt digital C19-YRS

NHS Lanarkshire is the second health board in Scotland to adopt the digital C19-YRS for use in their Long Covid Rehabilitation Pathway. Since implementation the trust has reported a 90% reduction in screening support needed and a 50% reduction on clinical triage.