

# BMJ Open Quality Evidence-based practice 'on-the-go': using ViaTherapy as a tool to enhance clinical decision making in upper limb rehabilitation after stroke, a quality improvement initiative

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## ABSTRACT

Recovery of upper limb function after stroke is currently sub-optimal, despite good quality evidence showing that interventions enabling repetitive practice of task-specific activity are effective in improving function. Therapists need to access and engage with such evidence to optimise outcomes with people with stroke, but this is challenging in fast-paced stroke rehabilitation services. This quality improvement project aimed to investigate acceptability and service impact of a new, international tool for accessing evidence on upper limb rehabilitation after stroke—'ViaTherapy'—in a team of community rehabilitation therapists. Semi-structured interviews were undertaken at baseline to determine confidence in, and barriers to, evidence-based practice (EBP) to support clinical decision making. Reported barriers included time, lack of access to evidence and a research-practice disconnect. The clinicians then integrated use of 'ViaTherapy' into their practice for 4 weeks. Follow-up interviews explored the accessibility of the tool in community rehabilitation practice, and its impact on clinician confidence, treatment planning and provision. Clinicians found the tool, used predominantly in mobile device app format, to be concise and simple to use, providing evidence 'on-the-go'. Confidence in accessing and using EBP grew by 22% from baseline. Clinicians reported changes in intensity of delivery of interventions, as rapid access to recommended doses via the tool was available. Following this work, the participating health and social care service provider changed provision of therapists' technology to enable use of apps. Barriers to use of EBP in stroke rehabilitation persist; the baseline situation here supported the need for more accessible means of integrating best evidence into clinical processes. This quality improvement project successfully integrated ViaTherapy into clinical practice, and found that the tool has potential to underpin positive changes in upper limb therapy service delivery after stroke, by increasing accessibility to, use of and confidence in EBP. Definitive evaluation is now indicated.

## THE PROBLEM

Current UK guidelines for the rehabilitation of arm function after stroke suggest that there is good quality evidence for interventions

that enable high intensity, repetitive and task specific practice of functional activity.<sup>1</sup> Such guidance and underpinning evidence is important for adoption to clinical practice if outcomes from upper limb therapy are to be optimised with stroke survivors: approximately 65% do not regain the ability to reach and grasp despite participation in rehabilitation.<sup>2</sup> To facilitate the delivery of evidence-based rehabilitation and best outcomes, clinical therapists need access to current evidence identifying and supporting interventions that are tailored to their individual service user needs. But such engagement with the evidence is challenging in the context of increasingly demanding and fast-paced healthcare services, especially considering adaptations to service delivery that include a need for more community-based rehabilitation as hospital length of stay for stroke survivors reduces.<sup>3</sup> Such a challenge, however, provides an impetus to find ways to increase the accessibility of evidence underpinning rehabilitation of arm function after stroke for busy clinicians; in the case of this project, we have used an internationally developed and freely available clinical decision-making tool named ViaTherapy<sup>4</sup> (<http://www.viatherapy.org>).

This project was based at the Cambridge and Peterborough NHS Foundation Trust (CPFT)—a health and social care organisation with clinical teams providing a wide range of services in in-patient, community and primary care settings. The Trust supports around 100 000 people each year and employs 4000 staff across 50 locations. The Trust is partner in the National Institute for Health Research Collaborations for Leadership in Applied Health Research and Care, East of England (NIHR CLAHRC EoE), allying itself

with CLAHRC EoE research themes that include innovation and evaluation.

The aim of the project reported here was:

To investigate (a) user acceptability and (b) potential service impact of the ViaTherapy decision-making tool with a group of physiotherapists (PTs) and occupational therapists (OTs) working in community settings.

An additional aim was to explore clinicians' current use of, and perceived barriers to, EBP in order to contextualise the use of the tool in practice.

## Background

Evidence-based practice (EBP) underpins excellence in clinical care and outcomes by integrating clinical expertise and best available research evidence with service user preference.<sup>5</sup> In general, healthcare workers have positive beliefs about EBP,<sup>6–9</sup> and PTs implementing EBP demonstrate improved clinical patient outcomes.<sup>10</sup> Despite this fact, almost half of PTs use evidence to inform their clinical decision making less than once a month,<sup>11</sup> and only 19% of clinicians agreed that research evidence was the most important resource in decision making.<sup>9</sup> Therefore, disconnects exist between EBP beliefs and actions; but why?

A number of barriers to implementing EBP have been identified, including, but not limited to: time, the challenges of responding to and adopting change, perceived limited applicability of research to clinical practice, clinician confidence and prohibitive cost of interventions that require expensive technology or equipment.<sup>12–15</sup> Time, in particular, is a commonly reported barrier and encompasses: time away from patient care, time to undertake literature searching and critical appraisal and time to set-up and carry out interventions.<sup>6</sup>

These identified barriers suggest that there is a place for an easily accessible means of quickly and efficiently integrating best evidence into clinical processes. The ViaTherapy tool, investigated in this report, uses an underpinning algorithm to provide accessible, evidence-based intervention recommendations for upper limb management after stroke, based on a stroke survivor's individual specific motor impairments.<sup>4</sup> ViaTherapy is freely available as a digital mobile device app (<http://www.viatherapy.org>). ViaTherapy was designed by a collaboration of international experts in stroke rehabilitation research and practice and launched internationally online in April 2017. ViaTherapy offers the opportunity to standardise evidence-based clinical decision making in this complex area of rehabilitation, while ensuring interventions are targeted at individual stroke survivor need. In this way, the algorithm aims to contribute to improved upper limb rehabilitation outcomes, and, therefore, enhanced quality of care after stroke. However, to our knowledge, there has been no work to date investigating the practicalities and usability of the algorithm in clinical services. The project reported here is therefore important to improve the likelihood of successful adoption of new tools for quality improvement, as well as shape

future iterations of those tools. Furthermore, the potential service impact of using the algorithm in practice has yet to be explored.

## Baseline situation

To investigate the potential acceptability and service impact of ViaTherapy and contextualise its use, exploring existing views on use of EBP in community rehabilitation practice is important. Hence, the baseline measurement consisted of a semi-structured interview exploring current engagement with and use of EBP. The interviews, carried out by a service improvement project lead (KC) with each of 13 participating clinicians, explored the following topics and themes:

Clinical background, length of time practicing and length of time practicing in neurorehabilitation, current resources used for treatment plan development, length of time spent developing the treatment plan, documentation style and language and length of time spent on it, any perceived barriers to using EBP, what might facilitate the use of EBP and confidence in using EBP. Clinicians were also asked to rate their confidence in using EBP to support clinical decision making.

Clinician demographics and analysis methods for the interviews are described in more detail in 'results.' In summary, the following themes emerged from the baseline interview responses, and are supported by the quotes presented in (*online supplementary material 1*).

## Resources for clinical decision making

Clinicians used a range of resources to support their clinical decision making, combining multiple resources together depending on the clinical situation and need. These resources included patient assessment, literature/evidence, guidelines and courses, peer support and past experience.

## Barriers to EBP

Time was the most consistently reported barrier in undertaking and using EBP. This included time in a general sense, time to undertake literature searching and appraising the evidence and time to set-up and carry out interventions. Being community based, the clinicians travelled between service users' homes—many felt this was not conducive to conducting a literature search and exploring the evidence and left them to undertake literature searching and appraisal in their own time.

Accessibility and resources emerged as a possible barrier to EBP; many clinicians did not have access to relevant databases or to the full text of journal articles. A lack of access to and resources for further training such as courses was reported. In addition, clinicians acknowledged there was lack of resources for the technology needed to undertake previously recommended evidence-based interventions such as functional electrical stimulation (FES) and robotics.

Some clinicians felt there was a research-practice disconnect. For example, inclusion criteria of many studies were

thought to be narrow, reducing generalisability to ‘real life patients’ who have a complex stroke and multiple co-morbidities.

A key theme here related to clinicians’ confidence. A majority of clinicians expressed their knowledge and experience of using a specific intervention impacted on their confidence to successfully implement it (less knowledge/experience—less confident). Clinicians felt that progressing knowledge through courses, hands-on practice or reading about an unfamiliar intervention would contribute to increasing knowledge and subsequently increasing confidence in implementing EBP. Peer support from supervision, team training sessions and having more time to find and appraise evidence were also reported to contribute to increasing confidence.

So, baseline measurement using semi-structured interviews confirmed previously established barriers to use of EBP such as time, research-practice disconnects and perceived lack of confidence. This finding supported the need to improve rapid accessibility to EBP ‘on-the-go’ for busy community clinicians. We developed a quality improvement project to evaluate the ViaTherapy tool in National Health Service community rehabilitation practice.

## DESIGN

A collaborative quality improvement project to investigate user acceptability and potential service impact of the ViaTherapy decision-making tool with a group of therapy clinicians working in community settings. Data were collected to meet study aims using semi-structured interviews before and after use of the tool, and a clinician confidence rating scale. According to CPFT policy of activities that constitute research, this service improvement met the criteria for operational service improvement, thus is exempt from ethics review. Trust governance for the service improvement project was granted by CPFT Research and Development service in March 2017.

### The team

The service improvement team comprised four expert neurological PTs with varied backgrounds in clinical practice, research, and academia, and a group of clinical partners. All interviews with clinicians were carried out by one of the project team leads, KC.

The clinician partners were community-based neurological PTs and OTs with a caseload encompassing acquired brain injury, including stroke and progressive neurological conditions. The teams worked across Cambridgeshire in the UK, a geographical area containing both rural and urban settings.

### Patient and public involvement

The tool being assessed in this quality improvement project has been developed to increase accessibility of evidence to clinicians involved in the management of people with stroke. The project itself involved, from the outset, the clinicians who are the end-users of the

**Table 1** Implementing PDSA cycle to explore usability and impact of ViaTherapy

Cycle stage	Application to the project
Plan	Acceptability and impact of introducing ViaTherapy to aid clinical decision making, utilising evidence-based practice on upper limb rehabilitation after stroke.
Do	Trial the use of ViaTherapy with a group of clinicians in community therapy practice, for 4 weeks.
Study	Interview clinicians prior to ViaTherapy trial and after 4 weeks of use to identify acceptability, what worked well, what needs to be improved, what are the potential service impacts.
Act	Synthesis of information from the interviews. Feedback to NHS partners and develop next plan of action for future use, training and development of ViaTherapy. Use information to plan large-scale implementation.

NHS, National Health Service; PDSA, Plan, Do, Study, Act.

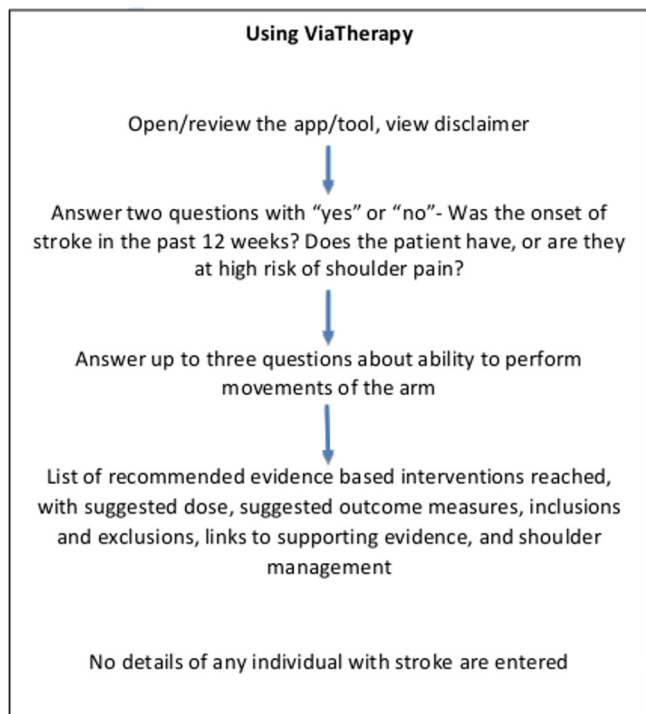
ViaTherapy tool. The methods reported here demonstrate engagement with those end-users from baseline through to the conclusion of this work. Neurorehabilitation service user involvement was not undertaken for this work as the aim was to evaluate the clinicians’ use of the tool. However, following the presented initiative, it will be appropriate for this group of clinicians to be invited to be involved in any further developments of this work (see conclusion), along with a group of people with upper limb deficits after stroke.

### Strategy and processes

The strategy implemented the ‘Plan, Do, Study, Act’ (PDSA) cycle, using qualitative methods to study the potential acceptability and impact of use of the tool in clinical practice. The specific implementation of PDSA to this service improvement project is demonstrated in table 1.

The clinical team was identified by a gatekeeper to the clinical service. An initial workshop was held, in which an overview of the project and details of ViaTherapy (how to access and use ViaTherapy) were presented. The simple steps involved in using the tool/app are summarised in figure 1.

Clinicians were asked to rate their confidence in using EBP to support clinical decision making, according to an 11-point numerical rating scale (0 not confident, 10 very confident). Following this and the the baseline interviews reported earlier, clinicians were then invited to use ViaTherapy as part of their stroke rehabilitation practice for a period of 4 weeks. The ViaTherapy algorithm was accessible to clinicians in two formats: freely downloadable app onto a smartphone or tablet, or a paper format.



**Figure 1** Steps taken on ViaTherapy to reach the intervention recommendations.

Follow-up semi-structured interviews at the end of the 4-week period, carried out by the same improvement project lead (KC), then explored the following topics and themes with each participating clinician:

ViaTherapy format used, length of time spent using the tool, positives of using the tool, what could be improved, resources used to develop treatment plans, had the therapist noted or made any changes in their treatment plan

development or documentation since using ViaTherapy, perceived barriers to EBP and confidence using EBP.

Clinicians were also asked to rate their confidence using the 11-point numerical scale in using EBP to support clinical decision making again, without access to their baseline confidence scores.

### Analysis

Interview transcripts were analysed by KC using thematic analysis taking an inductive approach.<sup>16 17</sup> The transcripts were read for familiarity and data were coded. The different codes were then assessed for similarities and data were collated within specific emergent themes. These were further reviewed and refined leading to the final themes. A second member of the improvement project team (NH) independently assessed the transcripts, data, codes, and themes. Discussions were held between KC and NH to resolve any disagreements. Confidence scores were simply expressed numerically.

### RESULTS

Thirteen clinicians participated. One clinician was unable to take part in the follow-up interview with KC; hence, data from 12 clinicians were included in the follow-up interview analysis. Six participating clinicians were OTs, and seven were PTs. Clinicians worked in community settings—mainly people’s homes with some sessions in gym facilities depending on individual service user need. Clinician experience ranged from 5 to 36 years of clinical practice, with a range of 16.7%–100% of their clinical experience practicing in neurorehabilitation (table 2).

**Table 2** Demographics, participating clinicians.

Clinician ID	Clinician profession	Years of experience	Percentage of total years of experience working in neurorehabilitation
01	OT	8	63
02	OT	15	17
03	PT	10	40
04	OT	22	64
05	PT	36	92
06	PT	20	65
07	PT	19	95
08	PT	7	100
09	OT	8	63
10	OT	9	22
11	OT	5	20
12	PT	5	50
13	PT	10	85
<b>Summary:</b>	<b>6/13 OTs, 7/13 PTs</b>	<b>Mean (SD): 13.4 (8.9) years</b>	<b>Mean (SD): 60 (29) % years</b>

OT, occupational therapist; PT, physiotherapist.

**Table 3** Clinician confidence in evidence-informed clinical decision making, before and after using ViaTherapy (numerical rating scale from 0=not confident, to 10=very confident)

Clinician ID	Confidence pre-ViaTherapy (/10)	Confidence post-ViaTherapy (/10)	Change in confidence (/10)
01	5.0	8.0	3.0
02	5.5	6.0	0.5
03	3.5	7.5	4.0
04	5.5	7.0	1.5
05	7.0	9.0	2.0
06	8.0	8.0	0
07	7.5	7.5	0
08	6.0	5.0	-1.0
09	6.0	N/a	N/a
10	6.0	7.0	1.0
11	5.0	7.0	2.0
12	6.0	6.0	0
13	5.5	8.0	2.5
	<b>Mean (SD): 5.9 (1.2)</b>	<b>Mean (SD): 7.2 (1.1)</b>	

N/A, unable to complete follow-up interview.

### Using ViaTherapy

Eleven clinicians used the app version of the algorithm, reporting ease of use and accessibility as the reason. One clinician chose to use the paper version, doing so because neither their private or NHS/work phone allowed access to download the app. They reported the paper version was cumbersome. Clinicians frequently raised the challenge of not having a suitable workplace-issued phone or tablet onto which an app could be downloaded; personal devices were used to access the app in these cases.

### After ViaTherapy—findings from follow-up interview: confidence in using EBP to inform decision making

Following ViaTherapy use, the majority of clinicians (8/12) reported increased confidence using EBP for clinical decision making, 3/12 reported no change and 1/12 reported decreased confidence as measured using a numerical rating scale (table 3). A majority of clinicians felt reassured that their current treatment plans were utilising interventions supported by evidence. After using ViaTherapy, clinicians reported that increased confidence was achieved through a deeper understanding and interpretation of the evidence and improved clinical reasoning skills. The one reduction in confidence (by one point) related to reduced confidence in critically appraising underpinning evidence made apparent by use of the tool.

The following themes emerged from the interviews and are supported by quotes in (online supplementary material 2). The themes have been grouped according to the aims of the project, exploring user acceptability and service impacts.

### User acceptability of the ViaTherapy app

Clinicians used ViaTherapy for between 5 and 30 min per person with stroke, depending on time spent reading about the intervention and the supporting evidence. Clinicians felt that choosing the time spent using the app was an advantage.

Most of the participating clinicians found ViaTherapy to be simple, easy to use, accessible, concise and straightforward. A majority felt that ViaTherapy supported treatment planning and clinical decision making through providing recommended EBP interventions. ViaTherapy was considered an easy and efficient way to access evidence-based interventions; clinicians found it reassuring that they were already using some of the recommended interventions in everyday practice. Some participating therapists also felt that using ViaTherapy helped to identify areas that they needed to develop further. These included: training in a particular intervention, additional reading to progress their knowledge/skills or courses to gain more hands on in-depth understanding. Some felt that links to the evidence and suggested outcome measures were useful in providing the option to do further reading, gain more in-depth knowledge and identify valid and reliable outcome measures to assess patients' progress. Clinicians found it helpful to find links to supporting literature rapidly, without having to redo a time-consuming literature search for every intervention.

### Service improvements: impacts on quality of clinical practice

Key themes related to quality and delivery of therapy practice emerged from the follow-up interviews. These were 'dose', 'treatment planning' and 'service resources'.

#### Dose

After using ViaTherapy and reading the evidence, half of the clinicians reported modifying the dose of the intervention they were providing; while the project did not quantitatively evaluate minutes of therapy or intensity of practice before and after use of the tool, these clinicians self-reported an increase in intensity and duration of therapy after using ViaTherapy. Clinicians also reported using the recommended dose from the app as evidence to help motivate people with stroke to work towards their goals.

#### Treatment planning

ViaTherapy prompted half of clinicians to use different interventions they were not routinely using; via the follow-up interviews, the participating therapists self-reported shifting their practice towards these more evidence-based interventions. In addition, a couple of therapists felt that ViaTherapy had encouraged them to spend more time planning, developing and incorporating evidence into the treatment plan. Increased use of outcome measures for the upper limb was also reported following use of the app.

A quarter of clinicians reported no change in clinical practice after using ViaTherapy. Of these clinicians, one did not have any current clients with a stroke, the others

felt ViaTherapy confirmed their current or planned treatment plan was evidence based and thus there was no shift in practice.

The resources clinicians utilised to develop their treatment plan were the same as those identified in the baseline interview, with the simple addition of ViaTherapy as a resource for the clinicians' tool kit.

### Service resource

Some of the suggested evidence-based interventions require use of specialist equipment and/or technology and/or training (eg, FES). However, not all of the technology and equipment is accessible to clinicians and stroke survivors, and there is a lack of resource to purchase new technology or equipment. The use of ViaTherapy highlighted the need for further training and development to carry out some of the less familiar recommended interventions (eg, motor imagery), but clinicians attending external courses and training activities reported a lack of resources to support them. Some clinicians felt this was a barrier to implementing EBP.

### Clinician feedback on the ViaTherapy tool

The following feedback, specific to the design of the tool, emerged from the follow-up interviews. Some clinicians thought the introductory algorithm questions were too broad, wanting more specific questions to get a more detailed picture of the person with stroke and their needs. Provision of active links added to the evidence and recommended outcome measures sections of the app could further increase accessibility to the evidence. Some clinicians reported that they would like to see more detail of the interventions.

Some clinicians did not have any suggested changes to ViaTherapy and were fully satisfied with how it worked for them in practice.

## LESSONS AND LIMITATIONS

There were four key lessons learnt from this work.

First, and perhaps most importantly, we learnt that experienced clinicians working in community rehabilitation were proactive in engaging with this service improvement project, being reflective about their current practice and positive about the potential for future change through engagement with the ViaTherapy tool.

Second, the baseline measurement confirmed that many of the previously published challenges of engaging with and using EBP are still evident in current practice.<sup>6 12–15</sup> Such challenges, including a lack of time to engage with the evidence, lack of equipment and technology as well as a lack of accessible information, contribute to the problem of a translational gap between research evidence and clinical rehabilitation practice.<sup>15</sup> Using best evidence to support service delivery is essential for excellent outcomes for people with stroke. The baseline situation here reinforced the need for change in access to and application of current EBP, to optimise outcomes and hence, this project was developed.

Third, while the ViaTherapy tool was made available in paper and app format, clinicians overwhelmingly preferred the app format. This use is quick, easy and accessible and provided 'at the fingertips' evidence-based decision making. The appeal of an app format is unsurprising as apps are now routinely used by health professionals<sup>18</sup> and are a part of everyday life for most. Indeed, a secondary app evaluating the quality of primary apps for rehabilitation is now available ('Mytherapy' <https://www.my-therapy.co.uk>), with ViaTherapy highly rated. However, service leads need to ensure that staff are equipped with technology enabling access to such apps, a point reinforced by the clinicians here. Since carrying out this work and reporting to the Trust, we have been informed that rehabilitation staff have been supplied with just such technology.

The fourth lesson was that, following use of the tool for 4 weeks, clinicians had increased confidence in treatment planning using the evidence presented by ViaTherapy. Similar findings have been reported for investigations of the use of tablets for accessing EBP in, for example, a rural health clinic in the USA.<sup>7</sup> Furthermore, service improvement was demonstrated by some therapists' self-reporting delivery of a higher dose of therapy interventions; there is evidence that increased dose of therapy is associated with improved functional outcomes and has positive effect on peoples' recovery and outcomes.<sup>19 20</sup> Hence, the project demonstrated the potential of a direct effect on service user management and activity by making evidence quickly and easily available. Importantly, the work here has demonstrated that use of this freely available, accessible method of accessing evidence for best practice is easily sustainable in practice.

### Limitations

The main limitation was the use of just one PDSA cycle for this project, so our data set was small. However, using interviews led to a depth of data both to support targeted aims for the project and comprehensively understand the clinical and service impact of the use of the tool in this case. It was not appropriate to do cost analysis as part of the present initiative. The project was run in one community rehabilitation service which could be seen as a limitation for application to other services, particularly in-patient rehabilitation. However, further funding applications are underway to investigate the sustainable impacts of ViaTherapy in different teams and on specific outcomes.

## CONCLUSION

The problem addressed by the improvement team was the need to make best evidence on upper limb rehabilitation after stroke more easily available and accessible to busy clinicians in a real-life community rehabilitation team. It was, to the best of our knowledge, the first quality improvement work to engage the use of such a tool in community rehabilitation for stroke.

The baseline position on use of EBP was reflective of findings in other studies.<sup>12–15</sup> Clinicians reported factors

such as lack of time, lack of accessibility to evidence, research-practice disconnection and a perceived lack of confidence as barriers to using EBP. This position reinforced a perceived need to increase accessibility to EBP 'on-the-go' for busy clinicians. So, we introduced the freely available ViaTherapy tool for clinical decision making in this complex area of rehabilitation to the team and investigated its user acceptability and service impact.

The project achieved its stated aims, in that this group of clinicians found the tool to be acceptable and accessible in its freely available app format. Participants reported that the app enabled confident use of evidence to support clinical decision making, both in terms of supporting current practice and enhancing future treatment planning. In some cases therapists self-reported direct improvements in service delivery such as increasing dose of therapy according to evidence. Our use of qualitative methods here in a quality improvement initiative enabled deep exploration of clinician views on usability and acceptability. Understanding such user experiences is key to adoption of new technologies in health practice.<sup>21</sup>

The participating NHS Trust has recently acted to ensure staff have technology to support engagement with such apps, improving possible sustainability of use. This potential sustainability warrants further investigation.

Therefore, we found that the use of such a tool has potential to enhance and improve therapy services provided to stroke survivors by increasing accessibility to and use of EBP. Large-scale projects using ViaTherapy are planned, including use in acute and in-patient rehabilitation services and investigating direct benefits for people with stroke.

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**Contributors** NH was the academic lead for the QI project, involved in its conception, design, analysis and interpretation of data, and drafting and revising the manuscript. KC was the QI team member involved in project design, data acquisition and interpretation, and drafting and revising the manuscript. CD was the NHS lead for the QI project and gatekeeper to the clinical team, involved in the conception and design of the work and important revisions to the manuscript. SW and MB made substantial contribution to the conception of the work and made critical academic contribution to the manuscript. VMP was the QI project supervisor, involved in conception and design of the project, overseeing acquisition and interpretation of data and critically revising the manuscript for important content.

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