Final Report

Understanding the opportunities and challenges of remote physiotherapy consultations and rehabilitation during the Covid-19 pandemic.

1) RESEARCH TEAM & KEY CONTACTS

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EXECUTIVE SUMMARY

Background

The Covid-19 pandemic forced clinical services to consider how they minimised risks of infection to both patients and staff. Many physiotherapy services rapidly changed from delivering care in-person to working remotely so services could continue albeit without any physical interaction, often using telephones or videoconferencing.

The aim of this evaluation was to understand the opportunities and challenges of remote physiotherapy consultations and rehabilitation during the Covid-19 pandemic. Specifically the objectives were:

1. To identify different methods of implementing physiotherapy remotely across broad settings
2. To understand how physiotherapists are evaluating the effectiveness of the interventions they are delivering remotely
3. To evaluate the multiple components that impact remote delivery of physiotherapy from patient and physiotherapists perspectives (e.g. utilisation, acceptability, cost, clinical decision making, clinical care, technical requirements, organisational impact).
4. To develop an understanding of the effectiveness of physiotherapy delivered remotely compared to face-to-face in different patient groups and settings and highlight exemplars

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Methods

Using the RE_AIM Framework, a mixed methods, real-world evaluation of remote physiotherapy delivery in the UK was undertaken in three stages:

- A scoping review of research evidence on the feasibility, acceptability, safety and effects of remote physiotherapy (Objective 1, 2, 4)
- An online survey of the physiotherapists delivering remote physiotherapy in the UK to understand how they were delivered and the barriers and facilitators to doing so (Objective 2, 3).
- A process evaluation through detailed case studies of remote physiotherapy services via interviews with service leader(s) and documentary analysis of routinely collected data (Objectives 1,2,3).

Results

Across all three studies there were different kinds of remote delivery with a large proportion of blended delivery (a mix of in person and remote physiotherapy). Only nine included studies in the review had interventions that were delivered completely remotely with no in person interaction. The survey did represent views on fully remote services but then reflected a move to more blended services as restrictions were lifted. All but one of our case study sites delivered a blended approach to physiotherapy, as although in-person physiotherapy became an option, it was still restricted (based on risk assessment and social distancing) and delivery needed to be considered in the context of the ongoing pandemic.

In all three studies, we found that either the fully remote or blended physiotherapy was safe, feasible and acceptable for the patients who could access it and who took it up (who it was suitable for or who wished to engage with it). There were incidents reported, but no incidents related to accidents or injuries when completing remote or blended physiotherapy. The review demonstrated comparable effectiveness to in-person physiotherapy and where data was provided in (two sites) the case studies showed comparable outcomes. Patients who participated in remote or blended services were reported to be largely satisfied with remote/blended physiotherapy as it was more convenient and could increase access to care. However for those participating during the pandemic it was often seen as a 'stop gap' and some preferred the 'personal touch' from in-person care and worried about getting their exercises wrong.

Throughout the project, we found that although remote or blended physiotherapy was suitable for a portion of the patients across all sites, it was not for everyone. The over-riding priority when deciding whether remote delivery was suitable for a patient was their clinical needs, technical situation and preferences. Whether remote delivery saved time varied and there was insufficient data to assess cost effectiveness to draw any conclusions.

Participants reported that remote physiotherapy was good for triaging patients, subjective assessment and delivering advice, education and self-management support, 'follow up' appointments to monitor progress and patients with who required a more simple assessment and intervention. It was less useful and effective for objective assessment, treatment that would benefit from a close view of the patient or being able to touch them, or patients with

‘complex’ problems. Sites in the survey and interviews suggested that remote consultations methods led to additional barriers to a successful consultation for some individuals with impairments (such as hearing loss, vision loss or cognitive impairment) or for individuals who do not speak English.

The way in which remote physiotherapy was delivered and implemented was highly varied, as were the technologies used. Telephone and videoconferencing were most common. Health professionals did discuss that some patients were digitally excluded from videoconferencing (lack of technology, connectivity or knowledge about how to use it), but could access telephone consultations. As well as effective leadership and organisational support, the main facilitators to successful implementation of remote physiotherapy were a flexible, creative approach and ‘can-do’ attitude, and careful planning and preparation so that policies, processes and materials were in place, piloted and practiced to deal with all expected activity and adverse events. The main barriers to implementation were unreliable technology; lack of resources (space, landlines, access to technology and other equipment, training); lack of knowledge and skills about which technologies to use and how to use them. Many physiotherapists were concerned, at least initially about patient safety (particularly falls) and whether they may ‘miss something’ when working remotely, but we found no evidence of this from the data or interviews (largely due to careful triage and the blended approach).

Staff experiences also varied. While some saw remote physiotherapy as a short-term stop-gap forced on them by the pandemic and which threatened their professional identity, others considered it an opportunity to reflect on their practice and instigate changes they had been considering for some time. While some services were supported and encouraged, others felt they made any changes in spite of, rather than with their organisation. The majority of our services who participated in the interviews intended to keep some aspects of remote delivery going forwards.

Recommendations

a) We recommend that remote physiotherapy continues, combined with in person consultations in a blended approach according to patients’ needs, resources and preferences.

b) We recommend that remote physiotherapy methods may be particularly useful for triage, subjective assessment, follow up appointments, and giving advice, education and self-management support
c) Further research is recommended to explore how we can effectively deliver objective assessment and treatments for patients who have more complex treatment requirements.
d) Planning and adjustments to remote consultations may be necessary to remove barriers for some individuals with impairments (such as hearing loss, vision loss or cognitive impairment) or for individuals who do not speak English.
e) To ensure successful implementation:
    a. Have flexible, creative 'can-do' approach; think 'outside the box' when necessary. Do not try to deliver remotely in the same way as in-person - you have to adapt
    b. Lever resources from the organisation.
    c. Involve the whole team and build on individuals' skills, knowledge and experience.
    d. Plan, prepare and practice. Ensure that all policies, procedures, protocols and materials to support delivery and deal with adverse events are in place and staff are familiar with them beforehand. This is especially important to deal with 'concerns' eg risk assessments; triage; assessment; treatment protocols.
    e. Recognise that delivering remote physiotherapy is time consuming and can be stressful. Have a 'buffer time'; between appointments to reflect; write notes, and take any further actions (such as referrals).

The ultimate factor governing how to deliver physiotherapy is patients' preferences and needs. **This patient-centred approach should be at the centre of decision-making.**

CHAPTER 1: BACKGROUND AND OVERALL APPROACH

The problem

During the COVID-19 pandemic, physiotherapy services delivered face-to-face have been curtailed. There was already high unmet need for services[1,2] and this gap has widened during the COVID-19 outbreak[3,4] with many patients experienced worsening in symptoms due to lack of therapy [5,6,7]. Physiotherapy service providers rapidly moved to remote consultations to allow services to continue without any physical interaction. This chimes with the NHS Long-Term Plan which emphasises of 'digital enablement' and health professionals having appropriate tools to support patients [8]. There is growing evidence supporting video consultations compared with standard programmes, but there is little evidence regarding the implementation of this model of service delivery [9-13].

Why is this important

There are potential benefits for remote service delivery, both for patients and services such as improved access for those who are shielding and reduction in travel resources but it could also exacerbate 'digital exclusion' for those who do not have the digital literacy, access or connectivity to use such services, thereby widening health inequalities. As the pandemic starts to recede and restrictions are lifted, it is important to understand how physiotherapy services have adapted to this remote delivery, service changes, staff experience and the experience of patients to inform future service provision.

Aims and Objectives

Aim: Understanding the opportunities and challenges of remote physiotherapy consultations and rehabilitation during the Covid-19 pandemic.

Objectives:

1. To identify different methods of implementing physiotherapy remotely across broad settings
2. To understand how physiotherapists are evaluating the effectiveness of the interventions they are delivering remotely

3. To evaluate the multiple components that impact remote delivery of physiotherapy from patient and physiotherapists perspectives (e.g. utilisation, acceptability, cost, clinical decision making, clinical care, technical requirements, organisational impact).

4. To develop an understanding of the effectiveness of physiotherapy delivered remotely compared to face-to-face in different patient groups and settings and highlight exemplars

Methods

A mixed methods, real-world evaluation of remote physiotherapy service delivery across the U.K [14] was undertaken using three forms of evaluation [15]:

1) Documentation evaluation to: map and describe previous service models and the changes made to deliver them remotely, including new clinical pathways and processes.

2) Formative/process evaluation using a case study approach to explore: type of consultation and purpose, delivery and preparation time, behavioural and attitude changes, what makes services successful, assess organisational context including, staff attitude to change and barriers to adoption.

3) Outcome evaluation (qualitative and quantitative data collection): to explore how moving to digital delivery affected outcomes including patients' level of inclusion, functional outcomes and re-access to services.

This approach is underpinned by the RE-AIM Evaluation Framework, a well-established implementation science framework which has been used for real world evaluations of telehealth and other health programmes [16]. Other implementation science theory, models and frameworks were considered but due to the pace and scale of change in the move to remote physiotherapy, it was considered that the more *pragmatic* approach of the RE-AIM framework was most suitable to produce results that are both rigorous and more relevant to stakeholders. RE-AIM focuses on individual (Reach, Effectiveness) and organisation level (Adoption, Implementation, Maintenance) measures to assess impact by addressing different levels of engagement and using a variety of data collection methods to maximise our understanding. At each stage, the response was assessed and discussed with the CSP and our Advisory Group, using that to influence the next stage. The advisory group (Appendix 1.1)

have been involved in all stages. Ethical approval was not required for this work as it was classed as a service evaluation and the University of Manchester's data governance procedures and individual trust governance procedures were followed throughout.

The evaluation involved three stages:

Stage 1: Rapid systematic review of the evidence for remote physiotherapy. This had two parts: 1) review of peer reviewed research papers and 2) websearch for relevant international, national and local reports of innovative practice, interventions and policies from services, health professional bodies and patient blogs.

Stage 2 Survey of CSP members to map how remote services were delivered and detail the data and evaluation undertaken.

Stage 3 Detailed Case studies

Informed by the survey, we selected a diverse range of services to further explore their experiences of remote physiotherapy including (where possible) service documentation and data and an interview with the service lead. We also carried out three workshops with physiotherapists (independent of the cases studies), patients (from the case study sites) and academics in the field to confirm our findings and explore any differences.

The following chapters present each stage and then make recommendations for future remote service delivery.

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CHAPTER 2- STAGE 1a RAPID SYSTEMATIC REVIEW OF THE EVIDENCE ABOUT REMOTE PHYSIOTHERAPY SERVICE DELIVERY (submitted for publication).

The Covid-19 pandemic has challenged health care professionals to rapidly change the care they provide and how it is provided. We define remote physiotherapy as those delivered using technologies such as the telephone, video conferencing, apps and web-based systems, rather than in-person [1, 2]. With so many changes which were often introduced under immense time constraints and other urgent demands, it is important not 'reinvent the wheel' and to use pre-existing resources and evidence. Remote physiotherapy is not new, it has been an area of interest over recent years, particularly in remote and rural areas [3-5] and as a way to triage assessment and management in high volume of demand in musculoskeletal services [6-8]. As part of our UK wide evaluation on the implementation of remotely delivered physiotherapy in response to the COVID19 pandemic, we first undertook a scoping review to explore the evidence-base for physiotherapy delivered remotely. As our interest was in implementation of remote physiotherapy as well as its effectiveness, our objectives were to investigate the evidence for outcomes, and feasibility and acceptability in terms of patient satisfaction; advantages and facilitators; adherence; safety; barriers and accuracy of assessment.

Method

The PRISMA scoping review guidelines [9, 10] were used as a framework for the review. The review was registered with Open Science Framework (http://osf.io/up62r/).
Three electronic databases (CINAHL, MEDLINE and the Cochrane library) were searched in July 2020 using key words relating to physiotherapy, remote delivery and experiences or outcomes (Table 2.1). We selected primary research studies or systematic reviews of any design in English which investigated delivery of remote physiotherapy. To ensure currency, papers published before 2015 were excluded, as were studies which delivered:

- electronic treatment in clinic (such as virtual reality)
- interventions which were not delivered specifically by physiotherapists (e.g. nurse-led cardiac care/ rehabilitation)

- interventions which did not examine the effects of remote physiotherapy, such as studies to develop technologies or studies of support to promote exercise after discharge from rehabilitation.

Titles, abstracts and then full text were independently screened by two of the authors against the selection criteria. Reference lists of selected papers were also screened for any other papers which met the selection criteria.

Table 2.2. Search Terms

Population	**Intervention**	**Outcome**
Physiotherapy or rehabilitation or therapy	Remote or telerehabilitation or mHealth or telehealth, or eHealth or mobile or tablet or teleconferencing or videoconferencing or virtual or e-rehabilitation or e-clinics	Satisfaction or change or barriers or adoption or implementation or maintenance or experience or views or opinion or facilitator attitudes or needs or outcome or facilitators or enablers
AND		AND

Details of the selected papers were extracted and tabulated according to the condition being treated. Then thematic content analysis was undertaken focussing on the outcomes, feasibility and acceptability of implementing remote physiotherapy. The emerging themes were extracted individually by two of the authors. The authors then met and revised the themes and iteratively identified categories and sub-categories. Any differences in interpretation were resolved through discussion.

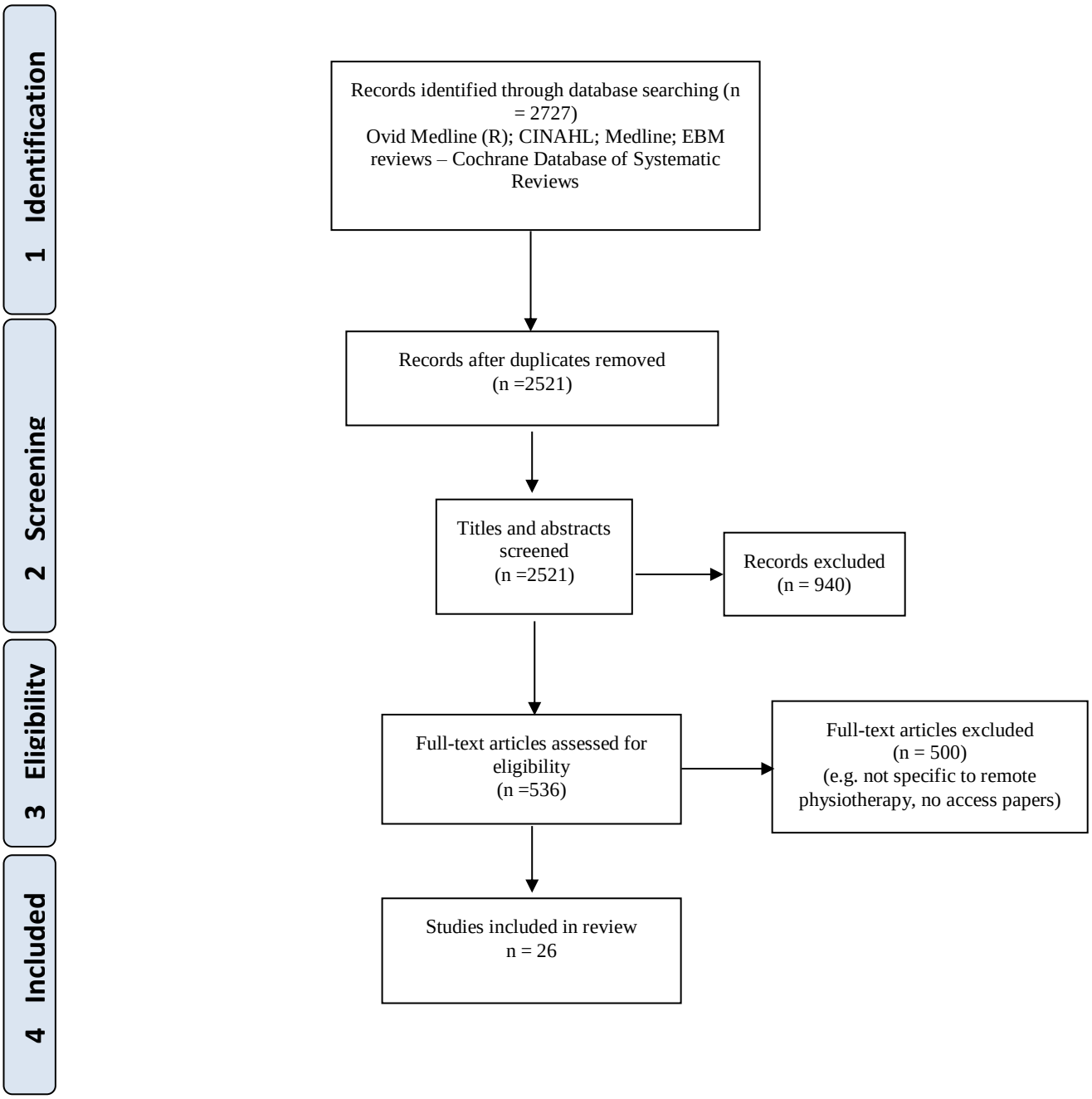
Results

2,727 papers were identified through the searches. After duplicates were removed and titles and abstracts screened, 536 papers were downloaded for full text screening, with a final 26 papers included in the review [11-36] (Figure 2.1).

Musculoskeletal problems were the most common condition addressed (n= 11, [11-21]).

Seven papers covered stroke and neurological rehabilitation [21-28]; five pulmonary disease [29-33] and three looked at cardiac rehabilitation [33-36]. Of the primary research papers, two were based in the UK[24, 28], with four each in Australia [15, 19, 21, 23] and Canada [18, 20, 32, 33] and two each in the US [13, 14] and New Zealand [34, 35] , one in Singapore [27] , one in Israel [26] and the remainder in the rest of Europe. A range of study designs were used; with five systematic reviews (two involving musculoskeletal conditions [11, 12]; two of stroke [21, 23]; and one of cardiac rehabilitation [34]). Four of the systematic reviews found sufficiently homogenous data to perform meta-analysis [12, 21, 23,34]. There was also four randomised controlled trials (three of musculoskeletal conditions [13-15] one in stroke [24]). Nine were cohort studies. Five were prospective (two of musculoskeletal conditions [17,18] ; one of stroke [25] , three of lung disease [29,30,32] and one of cardiac disease [36]). One was retrospective (of stroke [26]) and two were controlled cohort studies (one each of musculoskeletal [16] and lung disease [31]). There were three semi-structured interviews (one in musculoskeletal conditions [20] and two in stroke [27,28]); one questionnaire design as part of a randomised controlled trial (in cardiac conditions [35]); two cross-sectional surveys (in musculoskeletal [19] and lung [33] conditions); and one study assessed the reliability and validity of physiotherapy assessment when performed remotely [21] . Further details of the selected studies are found in Tables 2-5.

Figure 2.1. PRISMA flow diagram



Although methodological quality was not formally assessed in this review, the level of evidence from the randomised controlled trials (whether primary studies [13-15,24] or included in the systematic reviews [11,12,22, 23,34] was reported to be low-moderate. Samples sizes were generally small and power calculations seldom used. Although some sources of bias such as blinding patients or therapists to the treatment could not be addressed; others such as reporting of randomisation processes and concealment of allocation would be simple to address with no additional cost.

The control interventions were 'traditional' in-person physiotherapy whether in an out-patient department/clinic or home-based therapy. The interventions studied were described in several different ways including tele-rehabilitation; tele-care; remote care and m-health. For ease of comprehension and consistency, we have referred to the interventions collectively as remote physiotherapy.

Although the care was labelled as 'remotely delivered', few studies provided care without any in-person contact between physiotherapist and patient. Only nine studies were clearly completely remote only [13, 15,18,21,25,26,27, 29,32], six [14, 23,24,28,31,33] included some initial assessments or demonstration of exercises in person before continuing with remote methods of delivery. Seven either had a blended approach or an option for in-person contact if needed during the remote phase of care [8,10,11,12,17,20,22] (Table 2.2-2.5). The interventions within the systematic reviews identified include both fully remote delivery and blended delivery. We therefore summarise the results together as there are not enough studies within each different type of delivery across the clinical areas to lead to meaningful conclusions.

Unsurprisingly a wide range of technologies were used. The most common were simple technologies such has such as videoconferencing or mobile phones to deliver 'traditional' physiotherapy (that is the same as would be delivered in-person) from a distance [18,21,28,31-33] and these were the focus of the systematic reviews [11,10,22,23,34] . The most common physiotherapy-specific systems involved videos demonstrating patients' exercise programmes uploaded to a web-site or app. One system created an avatar to demonstrate the exercises [14]. These were generally asynchronous. Some also monitored adherence and performance of the exercise which was feedback to the patient and/or therapist. Direct contact with the therapist was usually via a 'visit' using video conferencing

when the exercise regimen was revised, and self-management advice or any other support given. A few of these interactive systems incorporated coaching, psychological support or behavioural change elements as well as exercise. In some systems, equipment such as body-worn movement sensors, heart rate monitors or pulse oximeters were used to give synchronous feedback on performance to the patient and/or therapist. Further details of the interventions are found in Tables 2.2–2.5.

As befits the wide ranging aims of the selected studies, the concepts and outcomes investigated were very varied, as were the measurement tools used. The aims of the selected studies could be broadly categorised as investigating the feasibility and acceptability of remote physiotherapy and its effects. Each of these are considered in detail below.

The feasibility and acceptability of remote physiotherapy

Feasibility and acceptability of remote/blended physiotherapy were the most frequent objectives of the selected studies (n=20), four of which were systematic reviews in which feasibility and acceptability were secondary outcomes [11,12,22,23] with the effects of remote/blended physiotherapy as the primary outcome. Four randomised controlled trials assessed feasibility and/or acceptability [13-15,22]. In all except Levinger et al [15] and Burridge et al [24], this was a secondary outcome. Seven cohort studies [16-18,25,26,29-32]; two cross-sectional surveys [19,33] and four interview [20,27,28,36] studies investigated feasibility and/or acceptability, all as the primary objective. Two papers [24,33] investigated the views of potential users (i.e. patients and therapists without experience of it), while all other studies involved people with experience of remote physiotherapy.

Feasibility and acceptability are broad concepts which we categorised as patient satisfaction; the advantages/ facilitators of remote physiotherapy; barriers to using remote physiotherapy; adherence; safety and the accuracy of remote physiotherapy assessments.

Patient satisfaction. Six studies assessed patient satisfaction [11,13,15,20,29,32]. Although a variety of measures were used, all reported that patient satisfaction was positive- described as high, very high or excellent. One study observed there was no difference in satisfaction between groups receiving remote/blended or traditional physiotherapy [13].

The advantages or facilitators of remote physiotherapy was investigated in eight studies [15,18,20,22,27,29,33,35]. The biggest advantage highlighted was that remote physiotherapy increased access to physiotherapy for those who could not travel for in-person treatment, whether because of the distances involved or the degree of disability. Furthermore, patients found remote physiotherapy more flexible and convenient than traditional delivery, enabling them to access therapy when it was convenient and fitted around work or other commitments. This reduced their costs with less travel and absence from work [19,27].

The other main advantage of remote physiotherapy was that it supported patients to perform their exercises [15,20,29,35] through demonstrations of the exercises. For this reason remote physiotherapy exercise platforms were preferred over paper handouts [18]. Exercise reminders and reinforcement messages were also useful, if individualised to fit in with the patient's daily routine to promote engagement and motivation to exercise [15,20]. Other features that users found useful were feedback on performance and adherence for both patients and therapists and interaction with a 'real' therapist [15,20,35]. In several studies, patients highlighted that the remote physiotherapy platform supplemented rather than replaced contact with a physiotherapist but enhanced the therapeutic relationship by creating an interactive and ongoing connection between them and their physiotherapist [15,20,28,33]. These views were broadly echoed by potential users of remote physiotherapy - patients and therapists in a traditional pulmonary rehabilitation services were asked about their interest in, and views of remote physiotherapy [19,33]. They both highlighted that the social aspect of rehabilitation was important and wanted a remote system to maintain this, for example through group exercise and education sessions and opportunities to interact with each other and the physiotherapists. Studies of patients' experience of using remote physiotherapy reported that patients reported enhanced self-efficacy, confidence and motivation to exercise when using remote physiotherapy, enabled them to monitor their condition and progress, using heart rate monitors and pulse oximeters for example, and it also increased their confidence to self-manage their condition [24,28,29].

Adherence to remote physiotherapy regimen was addressed in seven studies using a variety of measures [15-17,24,25,29,32]. Overall, adherence was mixed with some patients hardly exercising or using the remote system at all, and others exercising at or above the prescribed dose. Overall, studies which reported the proportion of patients meeting recommended doses varied from 35%-95% (overall, 71%) [17,25,29] and an average duration of exercise of

around 100 minutes [18,24,25]. One study reported much lower uptake of remote exercise sessions and completion of an online symptom diary (56% and 43% respectively) but this was over a two-year period [29].

Safety of remote physiotherapy (in the form of adverse events) was monitored in four studies of stroke and pulmonary rehabilitation [24,25,31] including one systematic review [23]. None reported any adverse events.

Barriers (whether perceived or actual) to remote physiotherapy relating to the technology, organisation and the physiotherapists' workload were reported [18,22,27,33]. Technical barriers included difficulties with setup; connectivity and the interface [17,18,27]. However few technological problems were reported in the selected studies [17,18,27,29,35], and when specifically evaluated satisfaction with the technology was high [29,35]. Organisational barriers to using remote physiotherapy were lack of clarity about the medico-legal / liability situation; licensing and intellectual property ownership; and charging processes [22]. While physiotherapists highlighted the potential impact of using remote physiotherapy on their workload as a barrier if physiotherapists were expected to provide it in additional to in-person care [33]. Lack of familiarity with remote physiotherapy systems and difficulty undertaking patient assessments remotely were further issues [27,33].

The reliability and validity of remote assessment was investigated in two studies [21] including one systematic review of eight studies [11] both involving musculoskeletal conditions. They found that validity of assessments for the elbow and shoulder joints and postural evaluation of lumbar spine were low but other assessments for the shoulder, elbow, lumbar spine, knee and ankle were adequate. Inter- and intra-rater reliability were also adequate except assessment of the elbow. The risk of bias in the selected studies was considered high as some studies involved students instead of professionals as assessors; sample sizes were small and there was a possible a learning effect in retest conditions [8].

The effects of remote/blended physiotherapy

The effects or effectiveness of remote/blended physiotherapy was the objective in 16 studies. Five were systematic reviews (two each of musculoskeletal conditions [11,12] and stroke [22,23] one of cardiac rehabilitation [34]) and three were randomised controlled trials (of musculoskeletal conditions [13-15]). Six were cohort studies; one of musculoskeletal

conditions [16], two involving stroke [25,26], four with people with chronic lung disease [29-31] and one of cardiac disease [36]. As noted above, the systematic reviews and randomised controlled trials generally involved medium to low quality evidence, and the cohort studies by their nature produced evidence at risk of bias. The outcomes measured tended to reflect the priorities of the clinical group involved. For musculoskeletal conditions, the focus was on joint and muscle impairments; pain and function. For stroke, this was activities of daily living, balance, upper limb function and health related quality of life, for caregivers as well as stroke survivors, while for cardiac and pulmonary conditions exercise capacity, physical activity and modifiable risks factors were measured. Regardless of condition, study design or measures used, the effects of remote/blended physiotherapy were comparable to traditional delivery whether measured immediately after the end of treatment or after longer-term follow-up. Five studies including one systematic review [14,19,23,29,30] assessed costs (rather than cost-effectiveness) as a secondary outcome, and reported that remote physiotherapy was less costly than traditional care due to lower therapist input; less travelling and /or fewer hospital re-admissions.

Discussion

This scoping review has indicated that remote/blended physiotherapy is feasible, acceptable and safe, with low-moderate evidence that the effects are comparable to traditional in-person physiotherapy. Patient satisfaction was high and adherence was mixed. Phase III randomised controlled trials with adequately powered samples are needed to more fully understand the clinical effectiveness of remote/blended physiotherapy.

It is noteworthy that the selected studies investigated remote physiotherapy delivered by physiotherapists working specifically to deliver it as part of the research study, rather than alongside all the other aspects of everyday physiotherapy practice. Furthermore, although the intervention was often delivered remotely, initial assessments were frequently completed in-person and are therefore referred to as ‘blended delivery’. Future trials need to use a cluster controlled design and process evaluations to investigate the effectiveness and implementation of remote/blended physiotherapy within everyday practice. The participants in the selected studies were patients and therapists who were sufficiently motivated and invested in remote physiotherapy to participate as there is some suggestion that uptake, satisfaction and adherence may differ when delivered as part of everyday practice [37, 38].

Further research is also needed to develop and assess the accuracy of remote assessment techniques. Our findings indicated that the reliability of remote assessment was generally adequate and validity was mixed. However this work only involved musculoskeletal conditions. Further work is needed to involve other conditions and increase the range of accurate assessment procedures to include all aspects of physiotherapy.

All studies that assessed costs, found that remote/blended physiotherapy was less costly and involved less health resource utilisation than traditional physiotherapy. However, the cost-effectiveness has not been addressed which should also be included in future trials.
Patient satisfaction with remote/blended physiotherapy was high. Patients valued the flexibility of remote physiotherapy which could be fitted around other commitments. None of the selected studies directly compared satisfaction with remote/blended physiotherapy with traditional delivery but other studies have found satisfaction to be comparable or higher than for in-person care [39, 40]. Future trials should include patients' satisfaction and experience of traditional physiotherapy delivery as well as remote physiotherapy using mixed methods, to enable a richer, more detailed understanding of the advantages and disadvantages and how services can be optimised.

The biggest advantages of remote/blended physiotherapy from both the patients' and therapists' perspective was that it increased the scope and flexibility of access to therapy. Social distancing requirements are a recent barrier to accessing in-person physiotherapy, which remote delivery can overcome. However, remote physiotherapy only improves access if people have the technology to do so. The more recent selected studies indicated that this was not a problem [19,35] and had improved compared to a study which collected data some ten years ago [18]. However the digitally excluded would not have been recruited for these studies. Digital exclusion is linked to social and economic deprivation[41, 42] not only in that some patients would be unable to afford the technology or internet connection, but also internet coverage is often poor in social deprived areas such as remote and inner city locations [43]. Therefore, where barriers to accessing technologies for remote physiotherapy cannot be overcome either due to access or for some individuals with impairments (this may for example include hearing loss, vision loss or cognitive impairment) or for individuals who do not speak English it is important that an in person approach remains available to support inclusion and equity of access to the service.

Remote physiotherapy delivery also need to be suitable for a range of technologies. For example, a mobile (or even landline) phone may be suitable for patients who cannot access or use a web-based system. Patients preferred remote physiotherapy to supplement, rather than replace in-person contact with a therapist [15,20,33]. Thus a hybrid or blended system, involving both may be most effective and acceptable. Future research needs to consider the exclusion rates for remote physiotherapy in different patient populations and explore ways to overcome them so that physiotherapy services are suitable and acceptable for as many patients as possible.

The other advantage of remote physiotherapy was that patients found systems which demonstrated home exercise plans useful to remind them when and how to exercise, which in turn enhanced adherence and confidence. This is to be welcomed as adherence to physiotherapy home exercise programmes is notoriously patchy and resistant to change [43-45]. Although the mechanisms of increased adherence have not been addressed, patients noted that access to on-going physiotherapy remotely enhanced the patient-therapist relationship, which is important [46].

It is reassuring that no adverse events were reported across either remote or blended intervention studies, as health care professionals have expressed concerns about patient safety if they are not physically present to assist a patient [47], or of 'missing something' if they do not have physical contact [47-49] and of risks to patient privacy and confidentiality [46]. Only one fully remote study reported health professionals concerns about assessments and safety [27]. Interestingly these concerns appear to be less of a problem for physiotherapists with experience of working remotely [47, 50]. These concerns are likely due to the need for therapists to adapt existing skills (such as using observation and patient questioning rather than 'hands on' skills) to assess and treat remotely, and to develop new ones (such as mastering the technology). These needs can increase workload, change established routines, and challenge professionals' confidence and identity [33], all of which may contribute to resistance to implementation. To effectively implement and sustain remote physiotherapy, there needs to be a recognition of the complex and often implicit, personal processes involved as well as sufficient resources (in terms of equipment and infrastructure), specific training and on-going support to problem-solve and build expertise [51].

The other main barriers to remote/blended physiotherapy highlighted in this review and echoed elsewhere [52] focussed on organisational and administrative factors. However, these may be expected to be expedited by the need to rapidly introduce remote working practice in response to the Covid pandemic [51-53].

Limitations

This was a scoping review so methodological quality of the selected papers have not been formally assessed. Some of the findings may therefore be at risk of bias and therefore should be retreated with caution. This is particularly true for the randomised controlled trials (and systematic reviews of them) which were usually underpowered and the randomisation, concealment of allocation and blinding processes were either not completed or poorly reported.

When presenting our main findings we have combined the results across studies using both full remote and blended delivery. It may be that a blended approach is more acceptable or feasible as it allows more flexibility, but the range of delivery type within the systematic reviews as well as across single studies included made them difficult to separate and therefore to come to firm conclusions.

We also limited the search to the main databases and papers published since 2015 to ensure currency but this may have excluded relevant or important papers published beforehand. Furthermore we excluded papers which were not specifically about remote physiotherapy so there may be relevant information from studies of tele-rehabilitation involving a multi-disciplinary team which is relevant to physiotherapy which we missed. However the selected studies were extensive and findings were consistent so it is unlikely that a wider scope of the search would have changed the results, but merely added to their strength.

Conclusions

Remote/blended physiotherapy is safe, feasible and acceptable to patients with comparable results to in-person care across some clinical areas, evidence in other clinical areas is very limited. Remote delivery/blended delivery is reported to increase access to physiotherapy especially for those who cannot travel to a treatment facility whether due to distance or disability. However, we have to be aware that most patients have self-selected to participate within these studies and strict exclusion and inclusion criteria and triage of patients make the

results more difficult to transfer to clinical practice. There are also a lack of studies carried out in the UK and a requirement for further research.

Table 2.2. Selected studies of musculoskeletal conditions

ACL= anterior cruciate ligament; MCID = minimum clinically important difference; RCT= randomised controlled trial

Author	Aim	Study Design	Sample	Intervention	Findings
Grona, et al 2018 [8]	(1) determine the validity and reliability of remote assessment (2) determine the health, system and process outcomes of remote physiotherapy for adults with chronic musculoskeletal disorders	Systematic review. Medline, CINAHL, PsycInfo, and Embase searched for trials and cohort studies on remote physiotherapy using secure video-conferencing January 2003 to December 2016. Quality analysis using standardized tools.	17 studies were selected. Eight assessed reliability and validity of remote physiotherapy assessment (n= 121). Nine were intervention studies: two case studies, one qualitative evaluation, three randomised controlled trials, one retrospective and one pre-experimental and one controlled cohort design. Controls were usual care	**Blended approach.** In some studies included patients could be seen in person if there was a clinical need. Secure video-conferencing.	Validity of assessments were mixed but inter- and intra-rater reliability was acceptable except for the elbow. The risk of bias was high. Given the range of designs in the intervention studies, risk of bias was mixed and pooled analysis was not possible. Overall outcomes between remote and traditional care were comparable in terms of pain, function, quality of life, and impairments remote physiotherapy compared to usual care. Patient satisfaction was high in the three studies in which it was measured.
Shukla et al 2016 India [9]	to evaluate the effectiveness of remote physiotherapy in after total knee arthroplasty	Systematic Review and meta-analysis. Embase, PubMed, and Cochrane were searched for studies in English 2000-2014. Outcomes = range of movement, strength; balance, mobility, pain, stiffness and function	Six (n= 408) trials. Controls = usual in-person care.	**Unclear** Video-conferencing delivered by experienced physiotherapists.	Patients reported high levels of satisfaction with remote physiotherapy. There were comparable outcomes in knee range of movement; quadriceps strength; pain; stiffness; physical activity and functional status between remote physiotherapy and usual care. Different study designs and outcomes prevented pooled analysis and methodological quality was mixed.
Bini and Mahajan 2017 USA [10]	to compare physical therapy delivered through an asynchronous video-based	Randomized Controlled Trial. Control = usual care. Outcomes were measured 3 months after surgery; pain, health status, and	51 patients were recruited. 14 randomized to intervention and 15 to usual care. Mean age = 62 years. 29 patients completed the final survey.	**Blended delivery** 2 in person session first. Asynchonous video-based therapy with 23 physiotherapist-created videos of exercises (same as in-person clinic) on an ipad. The physiotherapist sent an exercise	29/51 (57%) completed the study. There were no statistically significant differences in any clinical outcome or satisfaction between groups. Overall cost of hospital-based resources for the remote physiotherapy group was 60% less than in-person therapy, because of lower therapy staff resources. Patients were

	tool to traditional in-person outpatient physiotherapy following knee replacement	function. Satisfaction, adherence and resource utilisation were also assessed.		video to the patient who recorded themselves completing it. The therapist reviewed this, progress, gave advice and uploaded more advanced exercises as necessary. Other professionals and the patient could also review the videos. Technical support was available. Patients could request in-person visits at any time or to return to traditional protocols for part, or all of their care.	willing and able to actively participate by taking their own videos and submitting them for review.
Bettger et al 2020 USA [11]	1. to evaluate the effect of remote physiotherapy on costs 2. to examine whether effectiveness and safety of remote physiotherapy were non-inferior usual care following knee replacement.	Randomised controlled trial. Pre-surgery patients were randomized to remote or usual care (home or out-patient) physiotherapy. Primary outcome = total health-care costs. Secondary outcomes were function; knee range of movement; gait speed; and adverse events.	306 patients (mean age, 65 years; 62.5% women) recruited from four sites, randomized November 2016 to November 2017. 287 (143 in the remote physiotherapy group and 144 in the usual care group) completed the trial.	**Blended** 2 post-operative in person visits and patients could receive in person care if clinically required. The Virtual Exercise Rehabilitation Assistant (VERA) is a cloud-based remote physiotherapy system using 3D tracking technology to produce an avatar that demonstrates and instructs exercises with immediate feedback on exercise quality. Plus synchronous physiotherapist visits who prescribed individualized therapy before surgery and then weekly. Activity, exercise quality and adherence were monitored by the remote therapist asynchronously.	Remote physiotherapy had lower costs at 12 weeks after discharge than usual care (median, US$1,050 vs $2,805; $p < 0.001$) with fewer re-hospitalizations (12 vs 30; $p = 0.007$). Outcomes were comparable in terms of function at 6 weeks and 12 weeks; knee range of movement and gait speed, pain and falls.
Levinger et al 2017 Australia [12]	To examine the feasibility of a three month internet-based intervention to enhance recovery following ACL	Pilot randomised controlled trial assessed before surgery and 3 month follow up. Control = usual care.	32 (16 in each group) participants were recruited. Mean age of 29.2 ± 7.4 years; 9 females; 23 males. Fifteen dropped out (38% and 56% from the intervention and control groups respectively). Data from only 17	**Blended** Intervention = usual post-surgery rehabilitation plus open-access interactive website-support comprising information about ACL reconstruction, expected recovery milestones, strategies to overcome problems and	Remote physiotherapy was perceived positively as a useful and important tool (mean 7.75/10) for information, reminders and reinforcement to exercise. Reviewing the exercises (pictures and videos) helped patients remember how to do them. They valued the resource to supplement rather than replace contact with the physiotherapy. However,

	reconstruction in terms of knee pain, function, self-efficacy and fear of pain were also assessed.		participants were available for analysis (n = 10 intervention group; mean age of 32.2 ± 10.2 years, 4 females and n= 7 control group; mean age of 28.5 ± 9.1 years, 4 females).	recommended exercises. Plus reminders. Communication between patients and therapists via regular text or emails questions on symptoms and progress from which the physiotherapist identified any problems, gave additional advice or treatment.	adherence was low adherence. No significant differences between the groups over time in any measures of knee pain, function, self-efficacy and fear of pain were seen.
Correia et al 2018 Portugal [13]	To compare remote physiotherapy and usual care after knee replacement. To assess uptake and safety.	Non-randomised controlled cohort feasibility study. Single centre. Control = usual care. Outcomes = balance mobility, function, range of knee movement.	69 patients were recruited (37 to remote physiotherapy, 32 to control) according to their address. 10 did not complete the study; 8 in the intervention (21% dropout rate) and two in the control (7% dropout rate).	**Remote delivery (unclear)** Intervention not fully described. A digital biofeedback system for home physiotherapy using body-attached movement trackers which provided real-time feedback on performance while exercised independently at home through a mobile app. Plus a web-based platform in which physiotherapists prescribed, monitored and adapted treatment remotely. The number of 'correct' exercise repetitions contribute to patients' exercise goals.	Superiority of the intervention group were reported for all outcomes while less demanding in terms of human resources. Based on the MCID, clinically significant improvements in balance and mobility were noted in both groups but was greater in the intervention group after treatment and at eight week follow up. Treatment time was greater in the intervention group (median 31.5 hours vs 24 hours, p = 0.005). Control group received 24 in-person sessions. The intervention group received 3 in-person and two phone contacts, plus, on average 0.4 (range 0–2) assistance contacts and 2.5 extra therapist calls (range 1–12). 60% needed help with the equipment.
Hoogland et al 2019 Netherlands [14]	to evaluate the feasibility and patient experience of remote physiotherapy after hip replacement	6-month prospective cohort study	30 independently living adults (18-75 years) who had undergone hip replacement for osteoarthritis. December 2015 and February 2017	**Blended delivery** 3 home visits but only the first one seems to focus on the exercise and set-up (others for assessment), the rest remote. Patients followed a 12-week strengthening and mobility exercise program (at least 5x/week) with video instructions on a tablet PC and daily physical activity monitoring via a motion sensor worn around the neck. There were weekly phone contact with a physiotherapist.	26 patients (87%) completed the program. Average adherence for exercising 5 x/week =92%. Most common reasons for non-adherence were vacation or a 'day off' (25%) and work (15%). 8 technical problems were reported. Mean user evaluation score = 4.55/5.

Boissy et al 2016 Canada [15]	(1) to record the use and reliability of remote physiotherapy following knee replacement and (2) assess physiotherapists ' satisfaction and its impact on clinical objectives.	Cohort study embedded in a randomized controlled trial	97 patients who received 1,431 remote physiotherapy sessions post-surgery.	**Remote delivery** Researcher did set-up tech in the home. Remote physiotherapy videoconferencing program comprising a pre- and post-exercise assessment (structured interview and observation), supervised exercises ~30min (mobility, strengthening, function, and balance), home exercises to perform on days without supervised sessions, an advice on pain control, walking aids, and the return to activities.	Installation of a new Internet connection was required for 75% of participants, mean time to un/install the technology = 308 mins. 97% of planned sessions were delivered. 21% of which required reconnection. Remote technical support was given in 43% of sessions but impact on communications was minimal. The technical environment was considered good or acceptable in 96% of sessions. Clinical objectives were reached in 99% of sessions.
Cottrell et al 2018 Australia [16]	To identify patients' interest in remote physiotherapy and barriers to accessing remote physiotherapy services	Cross sectional survey	A convenience sample of 20 participants with chronic musculoskeletal conditions attending traditional orthopaedic out-patient physiotherapy services (n=6) between November 2015 and April 2016.	**No intervention** Participants were receiving traditional clinical based care. Asked about their interest in, and feasibility of remote physiotherapy	85 patients (71%) participated. Over half were willing to use remote physiotherapy if it reduced the costs (53%) and time (57%) associated with attending appointments. 43% would prefer remote physiotherapy over travelling to attend appointments. Patients in paid employment were more likely (65%) to be willing to use remote physiotherapy if it reduced work absenteeism. Overall, 78% of patients had appropriate technology to enable remote physiotherapy at home.

Abramsky et al Canada [17]	To explore patients' perspectives on home exercise programme and their experiences using a mobile application designed to facilitate home exercise	semi-structured, in-person interviews	10 participants (7 women, 3 men aged 22-55years) who received remote physiotherapy for a musculoskeletal condition from an out-patient based private physiotherapy practice between December 2015 and May 2016.	**Blended** Remote used to enhance existing in person therapy. A mobile application (Embodia) featuring exercise notification reminders, ability to track symptoms, video- based exercises and education, and instant messaging with the physiotherapist. Used for at least a month.	Patients were generally positive about the app. They preferred it to paper-based handouts because it reinforced the correct technique and enhanced engagement with their home exercise plan. Half of participants found the exercise reminders useful, but only if they had been customized to fit into their daily routines. The app could also enhance the therapeutic relationship by creating an interactive and ongoing connection between them and their therapist. Some described the app as an extension of, but did not replace their physiotherapist.
Cottrell et al 2018 Australia. [18]	To determine the level of agreement between a telehealth and in-person assessment of patients with chronic musculoskeletal conditions.	A repeated-measure, inter-rater agreement study undertaken between May to December 2016	Six (experienced advanced practice) musculoskeletal physiotherapists conducted the assessments. Assessors were paired to complete assessments for lumbar spine, knee or shoulder. Assessors had no prior telehealth experience.	**Remote** One assessment remote and one in person and compared. Participants were assessed by in-person and remotely in a single clinic session. In-person assessments were conducted as per standard clinical practice. Remote assessments were via videoconferencing.	Substantial agreement (83.3%; 35/42 cases) between in-person and remote assessments for recommended management pathways and diagnostics. Moderate to near perfect agreement (AC1 = 0.58–0.9) for referral to other AHPs. Substantial agreement (81%; AC1 = 0.74) when requesting further investigations. Overall, participants were satisfied with remote assessment.

Table 2.3. Selected studies of stroke and neurological conditions

RCT=randomised controlled trial; SMD = standardised mean difference; ADL = activities of daily living; FMA = Fugel-Meyer Scale; QoL = quality of life; SIS = Stroke Impact Scale

Author	Aim	Study Design	Sample	Intervention	Findings
Tchero et al 2018 France [19]	to investigate the efficacy of remote physiotherapy in people with stroke	Systematic Review and meta-analysis. MEDLINE, Cochrane Central, and Web of Science databases were searched for RCT of remote physiotherapy in stroke. Continuous data were extracted for relevant outcomes and analyzed as the standardized mean difference (SMD) and 95% CI in a fixed-effect meta-analysis model. Control = usual care	15 studies (1339 patients) selected with 12 included in the pooled analysis.	**Unclear, mix of studies.** Remote physiotherapy methods were varied. Some studies used only telephone calls, while others used videoconferencing, educational videos, Web-based chats, and virtual reality systems	Changes in ADL (Barthel Index SMD –0.05, 95% CI –0.18 to 0.08) balance (Berg SMD –0.04, 95% CI –0.34 to 0.26); upper limb function (FMA UL scale (SMD 0.50, 95% CI –0.09 to 1.09) and QoL (SIS mobility subscale; SMD 0.18, 95% CI –0.13 to 0.48), Caregivers Strain Index and satisfaction were comparable. One study showed that cost of remote physiotherapy was lower than usual care by US$ 867. Advantages were easier access to physiotherapy, and monitoring for disabled patients, and patients could self-record their progress and performance. Barriers included administrative licensing, medico-legal ambiguity, and financial sustainability.
Laver et al 2020 Australia [20]	To determine the efficacy of remote physiotherapy for ADL in stroke survivors compared with (1) in-person	Cochrane Systematic review and meta-analysis. Cochrane library, MEDLINE, Embase and eight additional databases were searched for RCTS of remote	Included 22 trials (n=1937, sample size in selected studies = 10-536). Reporting quality was often poor for randomisation and concealed allocation. Selective outcome	**Mixed delivery** Included mix of intervention as long as more of the delivery was remote. Interventions included telephone (n=8), videoconferencing (n=11) or a combination of phone, video, texts, email and /or a website (n=3) for post-discharge support, upper limb, lower limb and mobility retraining. Studies	There was no evidence of any differences between remote physiotherapy and either control. Evidence was moderate for ADL (SMD)-0.00, 95%CI 0.15 to 0.15); QoL (SMD 0.03, 95%CI -0.14 to 0.20) and depression (SMD -0.04, 95%CI -0.19 to

	rehabilitation or (2) no rehabilitation or usual care.	physiotherapy in stroke compared with in-person or no treatment.	reporting and incomplete outcome data were apparent in several studies.	were either on discharge from hospital or with people in the subacute or chronic phases	0.11), and low for ADL between remote and in-person (SMD 0.03, 95%CI -0.43 to 0.48) balance (SMD 0.08, 95%CI -0.30 to 0.46); upper limb function (MD 1.23, 95%CI -2.17 to 4.64). Five studies reported that remote physiotherapy health service utilisation or costs were lower than usual care. Two studies assessed adverse events, with none reported.
Burridge et al 2017 UK [21]	To asses feasibility and acceptability of remotely delivered self-directed exercises and ADL in people with stroke	Feasibility RCT including semi-structured interviews. Assessed before, after 3 weeks of intensive daily treatment and six months follow up.	19 stroke survivors (from 83 screened) recruited: 11 were randomly allocated to the intervention group and 8 to the control group (usual care).	**Remote delivery** Participants were taught how to do constraint induced movement therapy and then used LifeCIT (web-based constraint-induced movement programme) to continue the therapy. Participants had access to it for 21 days and asked to use it 5 days/week.	Intervention was well accepted and changes in upper limb function beyond the MCID were found at both assessment points. In addition, positive effects on self-efficacy, confidence to use the affected arm, and body image were reported. Mean treatment time was 3.2 (SD 1.7) hours/day on 13.6 (SD 2.1) days. No adverse events were reported
Held et al 2018 Europe [22]	to assess the safety, usability and patient acceptance of remote physiotherapy for balance and gait in stroke survivors' homes	Cohort Study. Patients were assessed before and after using the Rewire system for 12 weeks	Fifteen stroke survivors (6 in Switzerland and 9 in Spain) with mild to moderate lower limb impairments who used the REWIRE system for 12 weeks. Assessed before and after	**Blended delivery** Saw therapist as well as remote. rEWirE = asynchronous remote balance and mobility training monitoring by hospital staff. The platform = patient's station (virtual reality system using Kinect camera, TV and force plate), hospital station (cloud-based service so staff can review, schedule and personalize treatment sessions) and a networking station (at the health provider site) which mines data for common features and treatment trends among hospitals and regions.	Patients completed 71% (range 39- 92%) of the scheduled sessions and reported excellent scores on the Technology Acceptance Measure. Mean training duration/ week = 99±53min. No adverse events were recorded.
Kizony et al 2017 Israel [23]	To retrospectively document the effects of a	Retrospective cohort study assessed before and after eight week intervention. 2 months	N=82 (46 men), aged 22–85 years, 63 (76.8%) with stroke, 6 with traumatic brain injury, 6	**Blended delivery** Initial assessments and then remote. CogiMotion programme provides long-term physiotherapy to improve upper limb range of	Only 22/82 (26%) completed the System Usability Scale but those who did reported it highly usable (mean ± SD 89.1 ± 12.1) and

	remote physiotherapy program.	using the programme with clinical assessment of upper limb movements and function. Usability measures using the System Usability Scale and a focus group with clients	= other; 8 had multiple sclerosis. Clients had mild-moderate upper limb impairment. Most did not use their weak upper limb for ADL. Recruited September 2013 to August 2015.	motion, strength, endurance, and function after discharge. Consists of a hybrid synchronous–asynchronous system using Kinect 3D sensor in client's home connected to clinicians' computer. The client selects from ~20 interactive games and tasks using arm, leg and trunk movements to control the games. Clients were taught to use two games during 1st session progressed according to client's abilities. Typically, an additional game or task was taught at each session	enjoyable (mean ± SD 4.1 ± 1.1). Only ~1/2 of participants were assessed after treatment and showed significant improvements in upper limb impairments (FMA n=35, P=0.002, shoulder flexion n=42 p=0.003) with no change in function (Motor Activity Log).
Tyagi, et al 2018 [24]	To explore the stroke survivors', caregivers' and therapists' barriers and facilitators of remote physiotherapy	Semi-structured in-depth interviews and focus group discussions.	Participants (n=37) including stroke patients, their caregivers, and physiotherapists delivering remote care	**Blended delivery** Initial set-up and run through technology and exercises in person. iPad based system to deliver individualised exercise programme using resistance bands. The system comprised ipad (with exercises), exercise bands, portable sensors and interface with instructions, displays of the exercises and instant feedback (to patient and therapist) on performance via the sensors. Patients were asked to exercise 5x/week plus weekly FaceTime 'visits' with the remote physiotherapy.	Facilitators for patients = affordability and accessibility. For physiotherapists, it filled a service gap. Barriers for patients = setup difficulties; Physiotherapists-patient assessments were difficult, interface problems. Both - limited scope of exercises and connectivity problems.
Muller et al 2015 UK [25]	Participants' experience of remote vestibular rehabilitation +/- expert telephone support.	Semi-structured interviews	33 participants (10 men; mean age 27–84 yrs) with chronic dizziness recruited from primary care as part of a RCT.	**Remote delivery (telephone)** Booklet-based vestibular rehabilitation, with (intervention) or without (control) expert telephone support	Participants in the phone support group felt they had a genuine relationship between them and their therapist within three short sessions, and described their therapy sessions as reassuring, encouraging and motivational.

Table 2.4. Selected studies of chronic obstructive pulmonary disease. *COPD =chronic obstructive pulmonary disease*.

Author	Aim	Study Design	Sample	Intervention	Findings
Hoaas et al (2016) and Zanaboni et al (2017) Norway (two publications from the same study) [26,27]	To explore feasibility, acceptability, adherence to, experience, effects and resource use of long-term remote physiotherapy for COPD.	Cohort study over two years of remote physiotherapy. Assessed before and after 1 and 2 years using objective measures of adherence; COPD severity, activity and health care utilisation. Plus interviews and focus groups	10 Patients (5 men mean age 55 years) with moderate to severe COPD were recruited after a four week inpatient pulmonary rehabilitation programme	**Remote delivery** Patients used a treadmill, pulse oximeter and ipad to carry out individualised interval training on the treadmill and strength exercises 3x/ week, monitored by the physiotherapist via a website plus self-management advice and weekly video-conferencing with the physiotherapist. Participants completed an electronic form daily regarding their symptoms, oxygen saturation, breathlessness and sputum production.	There were no drops out over two years. Mean exercise sessions/week =1.7 and 3 symptom reports/week in the 1st year and fewer in the 2nd. Average completion of online diary = 43.3% and 56.2% adherence to online training sessions. Participants were generally highly satisfied with the technology and reported increased self-efficacy, emotional safety and motivation. Physical performance, lung capacity, health status and quality of life were all maintained at two years. There was a 32% reduction in health care utilisation compared with 1 year before intervention due to fewer COPD-related hospitalisations and outpatients visits.
Paneroni et al 2015 Italy [28]	Feasibility and acceptability of remote physiotherapy (pulmonary rehabilitation)	Controlled cohort study (multi-centre)	36 adults with COPD (age 66 years, 86% men) who had completed 6-12 month of out-patient pulmonary rehabilitation programme. 18 switched to a remote programme and 18 continued with usual care	**Blended delivery** Initial in person demonstration and set-up then remote delivery. Daily exercise using an interactive programme and cycle ergometer. Physiotherapists contacted patients by phone or videoconference to collect clinical data and to encourage and supervise the exercise. These virtual consultations were tapered off to encourage independent exercise.	Patients participated in 28 remote sessions over 40 days, lasting (mean) 100 minutes including strength and cycle ergometer training. No adverse events were reported. 84% were satisfied with the remote physiotherapy. Improvements in walking capacity, dyspnoea and quality of life were comparable ($p>0.05$) between remote and traditional physiotherapy.

Marquis et al. 2015 Canada [29]	to assess effects of, satisfaction with, and adherence to remote pulmonary rehabilitation	Cohort study. Assessing changes in exercise tolerance (6-min walk test and cycle endurance test) and quality of life before and after intervention	26 patients (15 women, mean age 65 years) with moderate to very severe COPD.	**Fully remote** 15 remote physiotherapy sessions (ergo cycling and strength training 3x/week) over 8 weeks via videoconferencing, wireless oximeter and heart rate sensor plus education via self-learning modules.	Significant improvements post-intervention in mobility ($p< 0.001$), exercise capacity ($p< 0.005$)), dyspnoea ($p < 0.001$), fatigue ($p = 0.002$), and emotion ($p =0.002$) domains of the quality oyf life. Participants' satisfaction and adherence were very high.
Inskip et al 2018 Canada [30]	Explore the views of patients and physiotherapists on remote pulmonary rehabilitation	Cross-sectional survey using questionnaires and focus groups	26 patients with a chronic lung conditions (50% men; mean age 72 years; 73% had COPD) and 26 physiotherapists (23 women; mean age = 43 years) who delivered hospital pulmonary rehabilitation. None had experience of remote delivery of pulmonary rehabilitation.	**No intervention**- participants were asked about their needs for, and the necessary features of remotely delivered pulmonary rehabilitation.	Most participants regularly used technology but some were "not at all comfortable" with it. Both felt remote physiotherapy needed to maintain the social aspect of group work and opportunities to interact with therapists. Suggestions were for group video chats, remote group exercise sessions, interactive video games, HCP moderated blog and smartphone for activity logging, social interaction, and exer-gaming to reinforce goalsetting and provide rewards. Heart rate and oxygen saturation while exercising were key, as were individualised exercises. Staff raised concerns about workload if remote work was added to their regular duties, and the need to be technically adept. They appreciated the value of remote physiotherapy to increase access to rehabilitation services for underserved communities

Table 2.5. Selected studies of cardiac conditions

Author	Aim	Study Design	Sample	Intervention	Findings
Rawstorn et al 2016 New Zealand [31]	To determine the benefits of remote cardiac rehabilitation	Systematic Review & meta-analysis. CINAHL, Cochrane Library, Embase, MEDLINE, PubMed and PsycINFO searched to May 2015 for RCTs comparing remote exercise based cardiac rehabilitation with centre- based cardiac rehabilitation or usual care for patients with coronary heart disease. Outcomes- exercise capacity, modifiable cardiovascular risk factors and exercise adherence	11 trials (n=1189)	**Mix of full remote and blended** 6 studies included had in person assessments before and at end. Remote physiotherapy delivered via telephone (n=7) and websites (n= 6) with asynchronous therapist review. Interventions delivered exercise prescription +/or monitored exercise performance +/or adherence. Exercise prescription was 2-5x /week lasting 30–60 mins at moderate (40–60%) to vigorous (70–85%) peak capacity usually while walking. All interventions also included feedback, education, psychosocial support and/or behaviour change components.	Physical activity, exercise adherence, blood pressure and cholesterol levels showed greater improvement following remote cardiac rehabilitation compared to usual care. There were comparable effects on exercise capacity and other modifiable cardiovascular risk factors
Rawstorn et al 2018 New Zealand [32]	to evaluate users' experience feasibility and acceptability of remote physiotherapy for people with coronary heart disease	Questionnaire assessment of usability and acceptability at 12-week assessment as part of a randomized controlled non-inferiority trial	67/82 adults with coronary heart disease who were eligible for outpatient cardiac rehabilitation, randomised to remote physiotherapy and who completed usability and acceptability assessment at 12-week follow-up.	**Fully remote (but difficult to establish)** Intervention = 12 weeks of individualized exercise prescription, real-time physiological monitoring, coaching, and behavioural support, delivered via a bespoke platform	Usability and acceptability were positively evaluated by most participants (n=44-66, 66%-99%). 58/67 (87%) would choose remote physiotherapy if it was available as usual care, primarily because it provided convenient and flexible access to real-time individualized support. Technological challenges were rare and had little effect on user experiences or demand for remote physiotherapy.

Laustsen et al 2020 Denmark [33]	to investigate the effect of remote cardiac rehabilitation .	Cohort study assessed before, 6 and 12 months after remote physiotherapy programme. Outcomes = physical capacity (peak oxygen uptake, muscle endurance, power, and strength) and HRQoL	34 moderate risk patients (82% men; mean age 58 years; 74% had angina) with heart disease 2–6 weeks after hospital discharge	**Blended approach** 2 initial assessments in person. Remotely monitored exercise 3x/week for 12 weeks via a smartphone, an app and a heart rate monitor. The app displayed heart rate on the smartphone including an alarm indicating training intensity limits. Data were uploaded to a website.	Significant ($P<0.05$) increases in physical capacity (peak oxygen uptake; muscle endurance, power and strength) and health-related quality of life were seen both 6 and 12 months post intervention except physical capacity at 12 months.

Stage 1b) WEBSEARCH

Methods

The google search engine was used to search the internet in December 2020 to identify websites and social media posts/blogs with relevant local, national and international practice, policy, guidance, service specifications and/or reports of health professionals' and patients' experience of remote physiotherapy. The search terms are detailed in table 2.6. The first 20 hits from each search were examined (Eysenbach & Köhler, 2002; Spink et al., 2002). One researcher carried out the searches and screened the websites. Two researchers then briefly summarised their content.

Table 2.6: Search Terms

Population	Intervention	Outcome
Physiotherapy Rehabilitation Therapy	remote, tele rehabilitation, mHealth, telehealth, eHealth, mobile, tablet, teleconferencing, videoconferencing, virtual, e-rehabilitation, e-clinics,	Satisfaction, change, barriers, adoption, implementation, maintenance, experience, views, opinion, facilitator, attitudes, needs, outcome, enabler

Results

Nineteen web-based resources were identified which are detailed, with links to the material in Appendix 2.1. Ten were briefing papers or practice guidelines, five of which were specific to remote physiotherapy. There were two physiotherapist-led websites with resources, information and suggestions for delivering remote physiotherapy, four reports of surveys of how physiotherapists had responded to the pandemic and delivering remote services and one example of delivering remote services; one report of an on-going research study and one patient blog.

Although individual details varied according to the context, the material selected in the websearch described how physiotherapists had responded to the pandemic by switching from in-person services to remote delivery, or a blended approach involving both. The findings broadly concurred with the scoping review in that remote physiotherapy was reported to be safe and comparably effective to traditional in-person care. Reported benefits were that it maintained or improved access to physiotherapy when in-person care was not possible and

also enabled staff who were shielding to continue working. To ease implementation it was recommended that existing resources and procedures were used as far as possible. The need to provide suitable resources and support in terms of training, workspace and equipment/ technology were highlighted. However remote physiotherapy did not appear to suit everyone and concerns about digital exclusion and health inequalities were raised. Overall a blended approach was considered best practice.

Conclusion

The websearch has identified useful resources for remote delivery, most created quickly to respond to the pandemic. Findings were broadly similar to our scoping review and we found a lack of practice based examples.

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CHAPTER 3- U.K WIDE SURVEY OF REMOTE PHYSIOTHERAPY SERVICE

In order to understand how physiotherapy services had implemented remote delivery, the barriers and facilitators and the outcomes from the patients' and staff's perspective we undertook a web-based survey. Furthermore we aimed to map remote physiotherapy services across the UK and to identify sites for the case studies (Chapter 4)

Methods

A web-based survey (Surveynet, www.surveynet.co.uk) which is the University's recommended encrypted survey tool) was devised and piloted with questions derived from the scoping review and web-search review (Chapter 2), with the advisory group, local physiotherapy managers, the CSP and the CSP networks. It included closed questions regarding:

- Type of services using remote physiotherapy (e.g. private or NHS, clinical groups).
- Geographical location (e.g. location, rural, urban)
- Type of technology used (e.g. teleconferencing)
- Purpose of the remote consultations.
- Patient characteristics (i.e. service or patient criteria for remote consultations).
- Outcome measures/key performance indicators collected (e.g. attendance rates, satisfaction questionnaires etc)

There were also open questions asking respondents about their experiences and recommendations (see Appendix 3.1).

The web-survey was distributed via the Chartered Society of Physiotherapy to its 59,000 members by email. It was further distributed to members of the CSP's Digital and Informatics Physiotherapy Group (DIPG) (n=240) and other relevant electronic CSP networks. Additionally, the survey was publicised on the CSP website and twitter accounts. The research team and School of Health Sciences also publicised the survey to their academic and clinical networks via twitter, blogs and Facebook. Service leads who were managing the delivery of remote physiotherapy services in the UK were asked to respond. Respondents could also consent to involvement in later stages of the evaluation. Descriptive summary statistics were calculated, and a framework thematic analysis (based initially on the survey questions) applied to the qualitative comments independently by two members of the evaluation team. Further synthesis was undertaken in discussion with the whole evaluation

team.

Results

One thousand six hundred and twenty responses were received, 60% of whom worked in the National Health Service with approximately equal representation from primary, secondary, community care and private practice (Table 3.1) (NB some services covered more than one area of provision). By far the most common area of practice was musculo-skeletal care, which was also described in several sub-specialties (Table 3.1), followed by neurological and stroke rehabilitation and then several primarily community-based areas. Geographically, most respondents served rural and urban areas (786, 48.5%), while approximately a quarter specifically served inner city (n=340, 21%) and sub-urban areas (n=422, 26%) respectively. Thirteen percent (n=206) served a rural area. Most responses were from England, most frequently the South-East (15%) with similar representation from each other region. Responses from other UK countries were proportionate to their population (Appendix 3.1).

Table 3.1: Characteristics of Respondents' Remote Physiotherapy Service (nb more than one response is possible)

	Number of services (%) N=1620	
Service sector[1]	Primary Care	357 (22.0%)
	Secondary Care	339 (20.9%)
	Community Care	313 (19.3%)
	Private Practice	339 (20.9%)
	Independent or Private Healthcare	84 (5.2%)
	Tertiary Care	76 (4.7%)
	Other	39 (2.4%)
	Social Enterprise	17 (1.0%)
	Charity	21 (1.3%)
	Hospice	13 (0.8%)
	Mental Health Care	11 (0.7%)
	Missing	4 (0.2%)
Clinical area[1]	Musculo-skeletal care	943 (58.3%)
	Trauma and Orthopaedics	259 (16.0%)
	Sports and exercises	228 (14.1%)
	Pain management	216 (13.3%)
	Rheumatology	95 (5.9%)
	Hand therapy	81 (5.0%)
	Neurological	250 (15.4%)
	Stroke rehabilitation	127 (7.8%)
	Pulmonary rehabilitation /respiratory	184 (11.4%)
	Children and Adolescents	185 (11.4%)
	Care of older people	181 (11.2%)
	Community Rehabilitation	179 (11.0%)

	Falls	151 (9.3%)
	Womens/Mens's health	110 (6.8%)
	Oncology and palliative care	102 (6.3%)
	Learning Disabilities'/mental health	84 (5.2%)
	Occupational Health	77 (4.8%)
	Amputees	54 (3.3%)
	Cardiac Rehabilitation	39 (2.4%)
	Intensive/ Critical care	24 (1.5%)
	Other	95 (5.9%)

A wide range of technologies were used, with 24 different platforms named (Table 3.2). However, by far the most common was a landline or mobile telephone (71.0%) followed by Attend Anywhere (38.5%), Zoom (31.5%), Accurx (14%), Facetime (13%) and Skype (10.1%). The remainder were used by less than 10% of respondents.

Table 3.2: Platforms Used (n= N=1327)

Platform used	**Number of responses (%)**
Telephone (landline or mobile	942 (71.0)
Attend Anywhere	511 (38.5)
Zoom	418 (31.5)
Microsoft teams	314 (23.7)
Accurx	187 (14.1)
Facetime	172 (13.0)
Skype	134 (10.1)
Whatsapp	63 (4.7)
Cliniko	19 (1.4)
Sisco / cisco Webex	19 (1.4)
Google meet	13 (1.0)
Physitrack	11 (0.8)
TM3	8 (0.6)
My COPD	8 (0.6)
Pexip	7 (0.5)
Visconn	7 (0.5)
Visonable	7 (0.5)
PhysioTech	7 (0.5)
Bluejeams	6 (0.5)
Email	5 (0 4)
One consultation	5 (0 4)
Video me/vidyo/videyo	5 (0 4)
Xuper	5 (0 4)
Escape Pain	5 (0 4)
Other	51 (3.8)

Remote consultations were most frequently used as part of an initial assessment (83%) and for screening and triage (67%), or to review, monitor and/or progress treatment (74%-76%). Treatment included exercise prescription or delivery (56-74%), providing advice, education or self-management support to individuals (70%, 64% and 56% respectively). Less frequently, remote consultations were used to evaluate outcomes (50%), provide treatment to groups (17%-9%) and assess the use of equipment (21%) (Table 3.3).

Table 3.3: Purpose of remote delivery (n=1327)

	No. of respondents (%)
As part of the initial assessment	1105 (83%)
Follow up and progress treatment	1004 (76%)
Prescribe exercise	982 (74%)
Monitor and review progress	984 (74%)
To provide self-management support	922 (70%)
Screening and triage	882 (67%)
Deliver advice e.g., health promotion advice, safe transfer advice	851 (64%)
Goal setting including review and progression of goals	831 (63%)
Deliver exercise one to one	776 (59%)
Deliver education one to one	747 (56%)
Evaluation of outcomes/ treatment effectiveness	663 (50%)
Assess and review use of equipment	277 (21%)
Deliver group exercise	222 (17%)
Deliver education in a group	155 (12%)
Support for remote delivery e.g. how to use the technology	155 (9%)
Other	75 (6%)

The answers to the survey questions regarding development and delivery of remote physiotherapy services reflected the rapid way they had been devised and implemented (Table 3.4). Less than half had a service specification or standard operating procedure for the remote physiotherapy service, even fewer had defined criteria for patients or referral processes, and just over a quarter had involved services users in development of the service. Evaluation of patients' experience was a higher priority with approximately half of respondents evaluating patients' satisfaction and/or outcomes. Around 20% evaluated the staff's experience/satisfaction, the time taken to deliver remote physiotherapy and digital exclusion (the proportion of those who were unable to use remote services). Costs of remote physiotherapy and adverse incidents were rarely evaluated. On a positive note, although 50%

of respondents reported challenges to delivering remote physiotherapy, half said they had overcome them, at least in part.

Table 3.4: Development and delivery of the remote service (n=1620)

	Number of services (%)
Service Development	
Service specification or standardised operating procedures for the service available.	Yes = 643 (39.7%); No = 581 (35.9%); Missing 396 (24.4%)
Patient population and referral criteria for the remote service were defined	Yes=514 (31.7%); No=693 (42.8%); Missing 413 (25.5%)
Users were involved in developing the service	Yes =451 (27.8%); No =791 (59.6%) Missing 378 (28.5%)
Service Evaluation	
Users were involved in developing evaluation measures.	Yes=162 (10%); No=795 (49.1%); Missing=663 (40.9%)
Patient's experience/satisfaction is evaluated	Yes=799 (49.3%); No=432 (27.0%); Missing=389 (24.0%)
Patients' outcomes are evaluated	Yes=860 (53%); No=262 (16.2%); missing = 498 (30.7%)
Staff experience/satisfaction of remote delivery evaluated.	Yes= 327 (20.1%); no = 714 (44.1%); missing=579 (35.7%)
Time taken to deliver the remote service evaluated.	Yes 345 (21.3%); No=649 (40.0%); Missing=626 (38.6%)
Cost of delivering the remote service evaluated.	Yes=203 (12.5%); no=747 (46.1%), Missing=670 (41.4%)
Information gathered on those who are unable/ unwilling to use the remote service (Digital exclusion)	Yes=310 (19%); No=696 (43.0%); missing = 614 (37.9%)
Not currently evaluating their remote service, but plan to so within the next six months.	Yes=435 (26.9%); No=84 (5.2%) Unsure=367 (22.7%); Missing=734 (45.3%)
Incident reporting	
Patient-related 'incidents' reported (e.g. falls, technology or software failure).	Yes=172 (10.6%); No=758 (46.8%); missing=690 (42.6%)
Challenges	
Challenges experienced in setting up remote services.	Yes=837 (51.7%); No=114 (7.0%); Missing=669 (41.3%)
Challenges have been overcome	Yes=193 (11.9%); No=46 (2.8%); partially =607 (37.5%); N/A= 62 (3.8%); Missing=712 (44.0%)

The responses to the survey's open questions gave detail to physiotherapists' experience of delivering remote physiotherapy. Two main themes emerged: 'The response to Covid-19' and 'delivering remote physiotherapy', which are detailed below.

The response to COVID

Three sub-themes were identified: 'A catalyst for change'; 'organisational support' and 'professional identity'.

Catalyst for change

During the pandemic, physiotherapy services needed to balance patient need/demand with minimising the risk of transmission of COVID-19 by following national guidance. Thus moving to remote delivery was *"forced on"* most physiotherapists as a "*stop gap"* as the only way to continue to deliver physiotherapy during the pandemic.

> *"I did not do remote work before Covid lockdown but it was the only way to see and treat patients so [it was] fundamental to keeping service open." (Private Practice, mixed caseload, Rural and urban setting).*

While most considered it a rapid, disruptive and challenging necessity, others found it an opportunity *to 'think outside the box',* gain new skills and created a catalyst for positive change.

> *"I have been requesting a [videoconferencing] platform for many years, so this is music to my ears. I cover a huge rural patch and don't feel the need to always complete face to face, and phone is not appropriate.' (Community, Falls, Neuro and Stroke service)*

The effectiveness with which services transferred to remote working was felt to be largely dependent on leadership at local/ service and organizational level. Pro-active and capable leadership made all the difference and required a willingness to adapt, skilled management of change and team dynamics, and knowledge and confidence with technology.

Organisational Support

A further important issue which influenced respondents' experience of the pandemic response and of delivering remote physiotherapy was the support received from their employing organisation, which many felt was insufficient. They reported the need for new equipment, infrastructure (offices, desks, phone lines etc.), technical support and training. Timely development of policy and procedures to ensure smooth implementation was also key. Physiotherapists often reported that they were working in ways for which they felt untrained and lacked confidence, which was stressful.

"There is clear lack of evaluating and reviewing the time element, and of training required to achieve skills to efficiently deliver remote services, which has led to increased stress/burnout and, at times disengagement of staff" (Secondary Care, Musculo-skeletal).

To implement remote physiotherapy, physiotherapists and patients had to adopt new technology and technological challenges were common.

"Pixilation due to poor internet has been a real issue and definitely affects our ability to provide a good assessment" (Facial Therapy, UK wide).

'We have had problems accessing hardware to deliver the service and then also problems with wifi/ports/etc.' (Primary Care Community, mixed caseload, Rural and Urban).

"When AccuRx has gone down again…you have to ring your patient and just say I'm sorry" (secondary care, musculoskeletal)

A further barrier was uncertainty about what was best technologies to use and concerns about security, patients particularly preferred a platform they were familiar with, something which was not always allowed.

''[Lack of] agreement on an appropriate platform has been the biggest barrier to delivering remote services….This has impeded service delivery where opportunity to work differently is identified but unable to, due to confusion about what is appropriate.' (Community Care, Children and Adolescents, Rural and Urban)

Older adults have done remarkably well with adopting video conferencing for family interactions, but generally are only comfortable with the platform they use at home e.g. Zoom and have difficulty adapting to a different platform. Restrictions have had a negative impact on our ability to deliver services." (Secondary Care, Vestibular Rehab,Rural and Urban).

Professional Identity

Changing the way of delivering physiotherapy made some consider their professional identity. In-person care and physical contact are considered essential parts of physiotherapy for accurate assessment and effective treatment, and many feared that virtual consultations would lead to loss of *'hands-on skills'*. Several questioned whether they were even *'doing physiotherapy'* if it did not involve hands on assessment and treatment. While others feared, it would affect training for the next generation of physiotherapists. Further concerns were

raised that remote physiotherapy could become the norm in order to reduce cost. This could devalue the physiotherapy profession, fundamentally changing its core values and practice

> *"I would be extremely concerned if this became the default. Physiotherapy is a caring profession and care is always better in the same room.' (Private Practice, mixed caseload, Rural and urban).*
>
> *"Virtual physiotherapy services are devaluing and downgrading our profession as well as leaving us vulnerable to litigation and being misunderstood as a profession by the general population." (Primary Care Community Rehabilitation, Falls, MSK, Pulmonary rehab, women's health).*

In contrast, some were positive about remote physiotherapy, and had embraced new ways of working.

> *"Virtual appointments have revolutionised my practice! I love being able to see patients doing their exercises in their home environment." (Private practitioner, Musculo-skeletal care, Rural and Urban setting.)*

Delivering Remote Physiotherapy

As noted above, the aspects of physiotherapy delivered remotely were highly varied, as were the technologies used to deliver them. It was very clear to respondents that remote physiotherapy would not be suitable for everyone and patients' preferences and individual needs should be at the fore when considering whether to deliver care remotely.

> *'Our evaluations have shown the choice to deliver face-to-face vs virtual care is very nuanced to patient clinical presentations and patient preferences.' (Community, MSK, Rural and Urban).*

Many issues regarding delivering remote physiotherapy were raised and views were highly varied. For most positive views and experiences, there was an alternative view. However this theme was categorized into two inter-linked sub themes – 'advantages and benefits of remote physiotherapy' and 'disadvantages of remote physiotherapy'.

Advantages and Benefits of Remote Physiotherapy

An important benefit was that working remotely provided a 'safe space from covid' for staff and patients (and their families) when there was much concern about risks of being infected. Furthermore, working remotely allowed staff who were shielding, or needed to isolate to continue working.

The most commonly raised advantages and benefits of remote physiotherapy was that it could save time by reducing time and travel (for therapists based in the community) and were more convenient for patients

> *"It saved patients from attending hospital. No childcare required, less time off work, no travel time etc. It also meant reduced time in clinic if a follow-up face to face appointment was required.' (Primary Care, Women's/men's health, Rural and Urban).*

From a service point of view, remote consultations were useful to triage patients to the most appropriate type of care, and to complete subjective assessments, which made subsequent in-person appointment(s) more focused and efficient.

> *'Remote consultation can be a very useful triage tool, saving time and travel within the community and helps to prioritise urgent cases more rapidly. This has meant our waiting-list has gone down more rapidly compared to normal.' (Community, Care of Older People,).*
>
> *"The advantage of the subjective being completed ahead of the appointment means you can assess more quickly in clinic and be more accurate on the diagnosis in-person." (Private practice, Musculo-skeletal, Urban setting.)*

Some found that being able to see the patient in their own home (via video) enhanced the assessment process and provided a more holistic assessment of the patient's function in their own home.

> *'I love being able to see patients doing their exercises in their home environment. I have picked up on issues I would not have done when they get shown the exercises in the clinic.' (Private, MSK, Rural and Urban).*

Views about delivering treatment remotely were mixed, however delivering one-to-one exercise was generally thought to be effective remotely.

> *"I have found the virtual sessions to be a lot more useful than I originally imagined they would be. Combined with subscription to 'RehabmyPatient', I have been able to prescribe targeted exercises that have been very effective." (Private, MSK, Rural and Urban).*

Views about delivering group-based physiotherapy remotely were much more mixed with many assuming that it would be infeasible; however some did successfully develop remote group sessions

"The people who attended my [Parkinson's Disease] group have found the virtual sessions very beneficial. Some prefer to continue with these rather than return to the gym.' (Private Community rehabilitation, Rural)

Education and self-management were feasible and effective when delivered remotely

"It has been interesting to note how it has made us reflect on our skills in teaching the patient to self-assess their face rather than us just palpating and assessing for them. This improves patients' understanding of their condition and their ability to regularly re-assess and adapt their programme accordingly, which has been a benefit' (Secondary Care, Facial Therapy).

"Patients are far more motivated to help themselves when it is a virtual appointment. Less passive in their approach." (Private, MSK, Rural and Urban).

Other respondents focused on the benefits that working remotely had for the multi – disciplinary team, describing benefits for communication and team working.

"It has also been helpful to arrange MDT meetings over Teams. Previously trying to get all professionals involved with a patient in one place in community was a significant barrier! (Community Neuro Rehabilitation).

"It has been incredibly useful during initial assessments to facilitate an MDT assessment in just one visit rather than us all being present or completing multiple visits. It's allowed family meetings to be attended by multiple staff and distant family members struggling with location. And it has also allowed qualified members of staff to 'dial in' to rehab sessions being delivered by the assistants to hand over programmes, provide training etc. (Community, Stroke and Neuro).'

Disadvantages of remote physiotherapy

As noted previously, experiences and views of remote physiotherapy were varied, and disadvantages or challenges were reported to counter many of the positives. Some found that patients were not keen on remote care

"Our audit shows patients have appreciated contact but want to return to face to face as soon as possible.' (Hospital and Community, Pediatrics, Urban)

"All [my patients] want F2F [face-to-face] as they don't consider remote consultations effective." (Private, MSK, Urban).

Although remote consultations were valued for screening, triage and subjective assessment, objective assessments were more challenging when the patient could not be clearly seen or touched.

> *"Assessments virtually are just nowhere near as accurate as face-to-face and we may miss things due to this. Orthopaedic tests can often be carried out by a partner with my guidance, but I missed being able to check reflexes, do cranial nerve tests etc." (Private, mixed caseload, Rural).*
>
> *"Every single patient I have assessed in-person has had objective measures that I was not able to assess properly via video" (Private practice, Sports and Exercise, Rural and Urban).*
>
> *"It had been extremely challenging to complete assessments and prescribe advice/exercises over the phone.' (Social Enterprise, Learning Disabilities, Rural and Urban)*

The concern that therapists may 'miss something' was very prevalent and not just restricted to assessment.

> *"When we have seen patients face-to-face we have picked up issues that have been missed by GP, consultant, hospital doctors, specialist nurses during phone consultation…. all of which needed urgent medical attention" (Tertiary Care, Lymphodema/cancer care)*

Many respondents felt that although patients who required 'straight forward' assessment, diagnosis was clear and treatment well established could be managed remotely, those needing more complex assessment and treatment needed to be seen in-person. Some respondents were concerned about barriers limiting the accessibility of remote physiotherapy for individuals with some sensory, physical or cognitive impairments or for non-English speakers.

> *"Many clients with cognitive impairments, hearing deficits, or balance issues need to be seen in-person for safe and effective assessment/treatment' (Community, Care of Older People, Rural and Urban setting).*

Others felt that providing therapy 'hands on' was non-negotiable

> *"Physiotherapy for people with learning disabilities is not possible remotely. A large part… is delivered through touch, presence and response to an intervention". (Community Learning Disability).*

This may have been the case for some learning disability services but other services have given other perspectives. For others, the concern was whether delivering physiotherapy remotely could exacerbate health inequalities through digital exclusion

> *"For patients who don't use the internet, I find telephone-only unsatisfactory. Try teaching exercises over the telephone, because you can't email their exercises or see them doing them to make sure they are accurate. Hopeless." (Private practice, mixed caseload, Rural and Urban setting)*
>
> *"The uptake of remote services has been very poor due to the lack of the required tech at home, both devices and data/wifi – We are in a very deprived area." (Social Enterprise, Pulmonary Rehabilitation, Urban.)*

As well as patients for whom remote physiotherapy was considered unsuitable, some aspects of remote treatment were found unsuitable or ineffective. Respondents noted difficulty delivering strength and resistance training without equipment, and progressing patients' treatment when they could not see them clearly. In contrast to the time-saving benefits reported above, others reported that delivering interventions remotely "*takes a lot more time and planning" (Charity, Children and Adolescents).*

Finally, several 'incidents' were reported while carrying out remote therapy. These ranged from technical failure, concerns about physical safety when patients are exercising and breaches of 'information governance' and confidentiality. We did not however receive any reports of injury or falls from remote delivery.

Discussion

This national survey found that most services were primarily using telephones to deliver remote physiotherapy services in response to the pandemic. This worked well for triage, screening and subjective assessments, delivering education/advice and self-management support and 'follow up appointments to monitor progress. However it was less successful for objective assessment, which many felt were inaccurate when attempted remotely (by video). Concerns about 'missing something' and falls were also often expressed. Delivering treatment, when physiotherapists needed to see the detail of their patient and/or touch them was also frequently considered problematic. Therapeutic touch is often considered a fundamental part of physiotherapy and not being able to do this led some to question, or fear for their professional identity. An over-riding principle was that, although delivering remote

physiotherapy could be feasible and acceptable and in some case, preferable to in-person care, it was not for everyone and should not become the norm. The highest priority criterion for whether patients were offered remote consultations should be patients' needs and preferences.

To the authors' knowledge, there has only been one previous publication regarding physiotherapists' experience of remote physiotherapy in response to the Covid-19, which was much smaller (n=207), specific to video consultations in Australia and used Likert scales to evaluate satisfaction [1]. Most were offering both individual consultations and group exercise classes via video and intended to continue to do so in the long-term (81% and 60% respectively). They report very high satisfaction levels for ease of use, comfort communicating, privacy/security, safety, 'satisfaction with management' and effectiveness. Bennell et al's [1] results appear rather more positive than ours. This may be, at least partly because 21% of respondents had previous experience of delivering physiotherapy sessions remotely and 15% had undertaken specific training. Thus, their practice was better established and one would expect many of the teething problems that our participants described had been resolved. It may also indicate that using videoconferencing is a more satisfactory way to deliver remote physiotherapy than the telephone [2]. Like our findings, frequent barriers to remote delivery were technical problems and the need to be able to see or touch patients. Several other publications have investigated the remote multi-disciplinary care or specific aspects of physiotherapy in response to the pandemic and echo our findings that it is generally feasible, acceptable and safe for those who can access it but not for everyone. It is quite consistent in the literature that remote care is not suitable for ~30-40% (ie about a third) of patients [3-7].

These broad findings also echo those of the scoping review (Chapter 2) but this survey gives much richer detail about real life implementation, rather than delivery within the context of a research study. Simple, widely available technology (ie the telephone) was most commonly used, unlike the sophisticated and novel technology often used in research studies. The common use of the telephone may also be a reflection of speedy ad-hoc way that services were developed during the pandemic, but are also likely to be less costly and possibly more acceptable to patients when it comes to implementation 'at scale'.

Limitations

This was a large national survey and we are confident that the sample of representative. However recruitment via electronic means and social media may have excluded some who were less *"tech savvy"* and there may also have been a response bias towards people who were interested in remote delivery. However the mixed views elicited indicates that recruitment was not limited to those with positive views who wished to promote it.

The other main limitations is that the survey captured a snap shot at a specific time, relatively early in lockdown when services were grappling with how to response to lockdown. One might expect that with time, as remote services become more established, experience builds and restrictions change that professionals' experience and views would mature and the service develop further. This longer-term view is addressed in the next chapter

Conclusion

Physiotherapists across the UK found remote physiotherapy largely feasible and safe for those who accepted it and for those who were able to engage with it, but it was not for everyone. Some respondents discussed how patients chose to defer treatment until they could be seen in person or simply could not access remote services (partly through digital exclusion). There were some incidents reported, but qualitative comments indicated these primarily related to technical issues or confidentiality issues. Remote delivery was reported to be most useful for subjective assessments, triage, monitoring and offering education, advice and self-management support. It was less feasible and acceptable for objective assessment and treatment where a detailed view or physical touch were advantageous.

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CHAPTER 4: CASE STUDIES.

Having established the strength of evidence for remote physiotherapy and surveyed CSP members about what was implemented and how, we wished to further explore physiotherapists' experiences of remote delivery across a range of different clinical areas and environments. We did this by undertaking a series of detailed case studies to evaluate digital exclusion, patient outcomes, staff experience, facilitators, and barriers of remote rehabilitation and produce recommendations for remote service delivery.

Methods

Site identification and recruitment

From the database of responders to the survey (Chapter 3), physiotherapy services which had consented to be contacted for further information and indicated that they collected data on at least two of the following: uptake by patients; digital exclusion, patient outcomes, patient and professional satisfaction, cost and time to deliver the service remotely. Sites which met these criteria were purposively sampled to ensure that a diverse range of clinical specialities, health care setting and geographical areas were included (Appendix 4.1).

Sites were approached between December 2020 and March 2021 by email with details of the case study protocol and a participant information sheet. Where deemed necessary, we worked with sites' research and data governance teams to ensure relevant data protection, confidentiality and any ethical processes were followed.

Data collection

Two types of data were collected. Firstly, quantitative data about physiotherapy provision and secondly interviews with physiotherapy service leads to explore their experience in more depth. As data collected by services was highly varied and services were coping with the demands of a third lockdown and redeployment from the '2nd wave' of COVID infections, we did not attempt to standardise the data obtained. Rather, we merely asked services to provide as much as information as they had, in whatever format they had it (for example audit report, service report, raw data), regarding the following:

- Patient outcomes including satisfaction
- Staff satisfaction
- Digital exclusion (characteristics of those who did and did not access remote physiotherapy) including uptake, non-attendance rates and Did Not Attends (DNA's).

- Time taken and cost of remote delivery
- Patient incidents.

We also asked sites for any documentation or policies regarding the remote physiotherapy service e.g. Service specifications, triage criteria, Standard Operation Procedures and patient documents (e.g. remote therapy guidance).

We carried out semi-structured interviews by videoconferencing with service leads of remote physiotherapy services (or staff members delivering remote physiotherapist pathways), recorded using an encrypted University device and transcribed verbatim. A topic guide was developed based on the findings of the review, the survey and in discussion with the advisory group. The prompts in the guide were tailored to each individual site based on their responses in the survey, service documentation and the data they had provided. Broadly, the topic guide covered the service before the COVID19 pandemic (including the organisational context); experiences of setting up and delivering a remote service – what had gone well, what had not gone so well, the behavioural and attitude changes staff had undergone to deliver remote services; facilitators and barriers to adoption, perceived costs and benefits of service change and future plans (Appendix 4.2).

Data analysis

Quantitative analysis of data from the sites was descriptive and highly heterogeneous. Where possible we have summarised across sites and compared outcomes before and after introduction of remote physiotherapy or between remote and in-person pathways. Where it is not possible, a narrative description was presented by searching for cross-case patterns [1]. Transcripts from the interviews were analysed both within case and across sites, using a framework thematic analysis. Coding was completed independently by four members of the evaluation team who were not involved in the data collection, members of the team also coded samples of each other's transcripts (blind to the original coding) to ensure they were identifying similar themes from the data. Discussions to develop the codes, case studies and cross-case patterns were held within the team (ST, HH, RS, AG, SA). We also built case studies for each site summarising their data from the documents and interview. Each draft case study was returned to interviewee for comment to ensure representativeness. Each individual case study is presented in Appendix 4.3 and an overview is presented here in the main text.

Results

Twelve sites took part in the case studies (Table 4.1); 10 were NHS based and two were private practices. Of the NHS Sites, three were based in hospitals – all in out-patient departments. Community-based services mainly worked in patients' homes but also ran rehabilitation programmes in gyms, health centres and council venues. One musculo-skeletal service was based mainly in GP surgeries. Four services mainly dealt with musculo-skeletal problems; three covered stroke and/or neurological problems, one was 'general' community rehabilitation service for people with limited mobility. There was one falls prevention service; one cardiac rehabilitation service; one pulmonary rehabilitation and one specialist paediatric service. None had provided care remotely before the Covid-19 pandemic.

Table 4.1: The Participating sites

Site	Clinical Speciality	Care Setting	Conditions treated	Referral routes	Assessments	Treatments offered
1	Integrated musculoskeletal service including 1st contact and advanced practitioners	Large hospital based out-patient department.	Acute and long term orthopaedics, rheumatology, pain, trauma, woman's health problems	Self-referral (1st contact practitioner); GPs and consultants.	Thorough assessment to give an accurate diagnosis (including diagnostic investigations such as MRI or ultrasound scan as needed).	Management plan is agreed with the patient. Often involves a structured exercise programme (individual and/or group based); self-management programmes for long-term conditions; corticosteroid injections
2	Musculoskeletal	Service provided in several local GP practices and hospital physiotherapy outpatients department.	MSK conditions including post-operative with a focus on acute and chronic pain management.	Self-referral, GPs and consultants		Gym exercise Home based exercise programme Hands on treatments (prior to COVID).
3	Community rehabilitation	Community based	Any housebound adult with a neurological, respiratory, or MSK problem. Includes frequent fallers, reduced mobility or those who cannot access traditional clinics.			The service integrates PT and OT with support from assistant practitioners, providing goal-led rehabilitation but not maintenance support.

4	Multidisciplinary stroke and neurological rehabilitation service .	Community clinics (three x/ week) but mostly home visits		patients with a neurological diagnosis in their geographical area		The service provided assessment and treatment for patients while 'progressing towards their goals'.
5	Cardiac Rehabilitation Service	Community-based 'council venues' More complex patients seen 1-to-1 at home, gyms, and within the class itself.	Patients who would benefit from cardiac rehabilitation including those with cardiac failure and with 'complex issues'.		Pre-assessment (with objective markers) before and after the rehabilitation programme. Also joint home visits with the OT for mobility assessments.	Rehabilitation programme lased six weeks (2x/week) of Individualised exercise circuits and group education supported by BACPR trained instructors.
6	Stroke rehabilitation team	Large multi-disciplinary team (n~50). Community-based, in patients' homes		Stroke consultants and acute (hospital based) stroke service	Assessments completed with 48 hours of hospital discharge. The team also complete 'six month stroke reviews'.	Group exercise, gym sessions and home based treatment. Patients are 'kept on the books' as long as they have therapy goals.
7	Neurological rehabilitation	Large (covering several counties) community-based private practice, in patients homes	Adults and children with acquired brain & spinal cord injuries, and also other neurological conditions.	Referrals from case managers and solicitors through litigation		Bespoke rehabilitation packages

				claims, and self-referral		
8	Falls Prevention Service	Clinic and patients' homes.	Adults at risks of falls	Health and social care colleagues and self-referrals.	Initial assessments to address risk factors for falls	Eight-week progressive strength and balance exercise class in groups of up to 10 participants and three staff.
9	MSK and Intermediate Care	Based in an intermediate care unit – in-patients plus a base for a MSK service provided in 'clinics'	In-patients - dementia and those with rehabilitation needs. Musculo-skeletal service - Orthopaedic and Trauma.	In-patient intermediate care staff. MSK service – self referral (1st contact practitioner) and GPs.		
10	Pulmonary rehabilitation service	Community based - In 3 different locations. OT will assess and treat at home if necessary. Large service – 2.6 wte PTs and 583 referrals in 2019-20.	Patients with COPD, Interstitial Lung Disease or and Bronchiectasis whose function is affected by their disease		Initial telephone triage and full assessment; falls screen, goal setting.	Pulmonary Rehabilitation programme (2x/week for 7 weeks) - group based exercise (1 hour), education (1 hour) and personalised management planning. Then onward referral to Leisure Services for self-management support and on-going activity.

11	MSK and sports injuries	'Traditional' city-centre private practice providing care in gyms and private clinics, plus occupational health and ergonomic assessment in clients' workplaces	Mainly working age clients attending on their way to or from work or in their lunch breaks.	Self-referral via the practice website, consultants or other third party referrals.		
12	Children and Adolescents	Specialist tertiary NHS service- providing out-patient/ clinic based care as part of a multi-disciplinary team.	Children with neuromuscular conditions	Consultants and other members of the team.	Review assessments in clinic every 6, 12 or 18 months	

The IMPACT OF COVID

In the interviews, the interviewees described a difficult and stressful time when they had to work with a high degree of uncertainty and rapid changes and adaptations, describing how they had to *"redesign services overnight"* (Site 1 and 12) . Several services were redeployed to cover inpatient work, or to expedite rapid discharges, while others worked from home or were initially closed altogether. All the services moved quickly to remote working in order for a service to continue, which they felt was a priority;

> *"It was really important to us not to just discharge patients. So what we did was we rang every patient... I must have spoken to 200 patients in one day to say "This is the situation, we still want you to be doing your exercises, we still want to continue with something" (Site 1)*
>
> *"I just had this feeling that there's going to be this group of patients that are going to have all of these longer-term issues and what would we do with them? They've become like this COVID generation of patients with all these multiple comorbidities" (Site 6)*

This was achieved in different ways according to local situation and the type of service (detailed in Table 4.2). Several found that they had an opportunity to reflect on and review their service because of reduced referrals during lockdown and they were able to introduce service developments they had been considering for a long time.

> *"We were able to do, in ten months, more than I've been able to do in ten years… I think it's been an absolutely unique opportunity to stop and pause and think "Right, what now?" To really scrutinise and critique what we did before, in a very objective way, to be able to put the patient at the forefront of what we do, and make sure that it's important to them". (Site 5)*

Site 4 began to 'pick up' stroke patients as they were discharged from hospital, site 10 reduced their waiting list, devising and implementing three separate more streamlined treatment pathways, while sites 3,4 and 8 focussed on creating new resources and adapting old processes. The director of Site 11 had previous experience of remote working (telephone triage) and wanted to include the patient in any service developments.

The two participating private practices had a somewhat different experience of lockdown: *"The CSP made me close our doors. They were very, very clear with us, it was virtual or*

nothing." (Site 7) NB the CSP did not mandate any physiotherapy service to close. At all times during the pandemic, the CSP advised members to follow public health guidance for their locality. Initially, this supported the use of remote physiotherapy where appropriate and possible, superseded by risk assessment.

It was imperative to adapt to the new circumstances or the business may not survive. *"It was the difference between furloughing my team and potentially going out of business - That's the hard fact, isn't it? Or fighting your corner and doing the best you can" (site 7).* Further concerns were whether patients, insurance companies and case managers would be prepared to pay for remote consultations, how they should be costed and how developments would be funded. *"Somehow physiotherapy provided by a private provider was a luxury ….and it was also an assumption that a private practice could just buy computers....but you don't just set up a computer system overnight. It's about your cloud-based technology, your record-keeping...and they were absent." (Site 7)*

Despite widespread concerns about whether patients would find remote delivery feasible or acceptable, whether they would accept information and advice delivered by a screen, and whether staff had the skills and resources needed, all services felt that introduction of remote working was successful and planned to continue with a blended approach combining virtual and/or face-to-face care in the long-term. The degree of success varied however. Site 3 felt remote working was rarely the best option for their client group and found the platform unreliable so they did not intend to continue with remote patient consultations but would continue having multi-disciplinary team meetings remotely. Site 8 was eager to return to their previous ways of working although they would consider continuing with remote exercise classes for patients who could not attend in-person. In contrast Site 11 felt *"COVID actually opened so many doors for us"* and intended to operate primarily remotely.

The data provided at each site are detailed in table 4.3. We originally planned to ask all sites to share prospective data about delivery of remote services using standardised measures. However the data collection period fell during the 3rd lockdown in 2021. At the time, services were under immense pressure and several were redeployed. Consequently, it was infeasible for sites to collect the data requested, rather they supplied any relevant data from routine data collection, audits, and service improvement projects. Sites 2, 5 and 12 were unable to supply any data. All sites took part in the interviews however. Unsurprisingly, the data presented are highly heterogeneous which prevents any objective analysis or comparisons between groups.

Instead we provide a narrative summary of the data obtained for each issue.

Table 4.2: The impact of the Covid Pandemic.

Site	**Initial Impact (March April 2020)**	**Long-term Impact (June 2021)**
1	Initially most staff were redeployed to work on the wards, with those who were unable to do so continuing to provide the musculo-skeletal services. The service shifted from in-person to remote delivery. Patients were contacted to tell them about the proposed change and they could 'opt-in' to remote care if they wished. Remote group sessions were not possible because of 'governance issues' and lack of a suitable platform. Strong leadership ensured that the necessary resources were provided.	The barriers to group sessions were overcome and the pain management programme restarted using Teams. The team valued remote care to promote self-management of long-term conditions such as chronic pain. Competencies to deliver remote physiotherapy were established. Although technical problems caused some challenges for patients and professionals, the service plans to continue with a blended remote and in-person service when it suits the patient's needs and preference.
2	Before and during the COVID-19 pandemic, patients preferred PT at their GP practice because it was closer, often with shorter waiting lists. Different GP practices had different COVID policies. One practice closed the PT clinic so all patients had to go to the hospital outpatient department. Others accepted the need for some patients to be seen in-person. When the pandemic hit, care swapped to video and/or phone consultations using Accurx, but then moved to AttendAnywhere to triage to remote or face-to-face care, depending on patients' needs and preference. 'Straight forward' patients were managed remotely. Those with more complex needs were offered in-person treatment at the practice or hospital OP dept.	~40% of cases were treated in-person. Over time, the GP practices became less stringent and allowed patients to be seen in their practice. Virtual care was thought to be generally effective. Issues that rose included; ensuring the patient was in a safe place at the start; video assessments were inaccurate (eg range of movement). Patient reported outcome measures replaced objective measures. With time, treatment moved towards a self-management approach. Exercises were prescribed, but it was sometimes difficult to ensure they were performed correctly. All treatment was individual, group sessions were not possible with the platforms chosen. In the longer term, the service intends to continue with a blended approach.
3	As the pandemic hit, the lead PT retired and another PT went on maternity leave, leaving only one PT to run the service. To cope with this, the service focussed on triaging and signposting patients to other services. They used NHS Anywhere (trust preference) for virtual assessments and reviews.	Overall, video conferencing was unsuccessful as patients often could not access the technology and/or it was unreliable. They primarily used telephone. Neither video nor telephone captured the patients' home environment for virtual home visits. This limited the holistic approach on which the service prided itself. They did however find remote working useful for MDT meetings and felt they would retain this. In the long-term, they would incorporate more initial telephone consultations and follow-ups into the in-person delivery.
4	Although home visits remained for urgent cases (eg to avoid hospitalization), all non-urgent in-person visits were suspended and AccuRx (recommended by Trust governance) was used to continue treatment remotely.	Difficulties with unreliability of the platform and inaccuracy in triage systems were noted. Remote delivery was felt to be effective in 'straight forward' cases, in which case it saves time. However, there was quite a large group of patients for whom it was unsuitable, who needed an in-

		person or a blended approach. In the long-term, they will take a blended, but predominately in-person approach.
5	At the start of the pandemic, the service was suspended, but not redeployed. The time was used to catch up on clerical activities and set up a remote service. They used the myHeart app to support remote delivery. It is a comprehensive cardiac rehabilitation programme with a virtual walking programme, education; mindfulness (for anxiety); medication diary; monitor for weight, blood pressure, and any ECG results. Patient who could/would not access this were offered personalised exercise cards to do at home. Patients were given a leaflet about each option, then virtual discussion before starting their chosen programme.	Overall the service felt they benefitted from the response. Despite the initial shock, it gave them time and space to re-assess their delivery. They have moved towards a more person-centred, patient-led approach, adjusting outcome measures to fit the patient as the previous measures did not work with digital delivery. The response from patients has been good. There have been no major technical problems. They intend to maintain a blended approach in the long-term.
6	The service changed to remote delivery by telephone or video with blended or in-person visits for those who could not use remote. Group therapy (1 x/week, 90 mins) sessions for 6 weeks. 1 for lower limb and one for upper limb continued through videoconferencing. Before the group sessions, the patient had an in-person session to collect baseline outcomes, discuss goals and demonstrate the exercises. Also assessed technology, access to internet, and gave written/ picture exercise instructions and a record sheet. Outcome measures were repeated after the final session and record sheet collected in-person. Family members were welcome to join in. Each group had a specific risk assessment taking into account technology, cognition, communication, medical history, mobility, home environment, pain/ injury, emotional factors and caregivers.	The shift to a blended provision was successful – outcomes were maintained. Success attributed to drive from the team lead with a positive, can-do attitude, getting information, training and support in place quickly. It was important to recognise patient preference in decisions about whether to see remotely or in in-person. They were very reluctant to endorse any type of algorithm or decision-making tool. They intend to continue with a blended approach, using remote delivery where it enhances the service and suits the patient.
7	The only way for this private practice to continue was virtual. They had very little guidance or support and had to work together to problem solve and explore what was possible – platforms; techniques and strategies; protocols, learning new skills etc. Every patient was contacted, the plan explained and willingness to 'go remote' ascertained plus the platforms available to them. The practice administrator supported patients with set up and road tested their platform. They developed "house rules" for remote sessions, discussed them with each patient and got consent. Within 3 days, 85% of the booked sessions had 'converted' to remote delivery. Strategies	Private practice had different challenges to the NHS because it was uncertain whether case managers would pay for virtual PT and if patients could/ would engage. The service leader actively led the change and engaged staff. Skills, confidence and motivation to work virtually varied and some needed considerable support. Video and phone worked for many patients but not all. Children were the most difficult to engage. Sometimes due to lack of access to technology. The service developed and sent additional resources to engage children during video treatments. Some assessments (eg seating and positioning) could not be done remotely and needed to be in-person. This service will revert back to in-

	and protocols to ensure safe, meaningful and realistic practice were developed. Their first session was used to establish a baseline of a safe place to work, viewing angles, support and equipment required. Patients' preferred platforms were WhatsApp and Zoom.	person delivery but will utilise a blended approach to assist patients to self-manage long term.
8	A well-established 6-week virtual exercise programme was implemented that included falls education and exercises for strength, balance, endurance, bone health and agility. Supplementary resources that participants could review them in their own time were also produced. The main outcome measure was changed to the Activities Specific Balance Confidence (ABC) Scale as it is self-report and can be done remotely. Initial assessment was remote (phone or video) where possible, but with a home visit if not. Patients with access to technology received support to use it with a home visit if needed plus an 'induction' session to familiarise patients with the technology and the programme. Each remote group exercise session had 1 PT, 1 Rehab Assistant and up to 5 patients. The assistant demonstrated the exercises, while the PT acted as moderator and observer providing feedback to patients and dealing with any technical issues. Before the session, the team ensured safety measures were in place (eg contact details in case of an adverse event), debriefed after each session and shared feedback at the weekly team meeting.	Careful planning and implementation, staff co-operation, strong leadership led to a successful review and re-direction of the service etc. Although the virtual groups were not appropriate for all patients, it increased reach to some who would struggle to travel to in-person groups. Remote attendance will be considered at least in the short term as an option for those who cannot attend in-person classes.
9	**MSK:** The services moved to remote delivery for individual and group sessions using telephone, Teams or Attend Anywhere plus the free Hep2Go service to provide exercises to the patient. Some in-person care was also used when needed. Virtual groups - A clear and detailed Standard Operating Procedure with contingency plans for technical problems was drawn up and staff trained. Infographics and guidance are sent to patients before their remote session and a consent checklist is completed to ensure patients fully understand the safety, technical and governance issues. Individual sessions – The PT was shielding and so did this from home. The caseload was mixed (shielding patients, multi-morbidities, chronic pain, rheumatology, auto-immune conditions, older adults with social issues) including those who would previously have received community rehabilitation or other services that were	Overall the remote MSK service was found beneficial for staff and patients, particularly those who had to shield. However, a fully remote service was not considered sustainable, acceptable or appropriate; a blended approach will be offered in the future.

	redeployed. Decisions about who needed in-person treatment was driven by the Trust clinical guidance.	
10	The team were initially redeployed to assist discharge and rapid response teams until June 2020. Then returned to develop pathways and implement a remote programme following British Thoracic Society and NHS guidance in July 2020, when 50 licences of a 'clinically evidenced virtual programme' were made available. All patients on the waiting list were reviewed to establish their abilities and preference for remote delivery. Three pathways were developed to ensure equitable access to effective treatment for all patients. Pathway 1. Remote (Online) - Clinical assessment at home and (optional) 1st exercise session in-person, then used SPACEforCOPD and AccuRx consultations, SPACE was then replaced by MyCOPD app and team developed pulmonary rehab YouTube Channel with weekly phone/virtual call follow up. Pathway 2. Remote (Paper support and phone consultations) - Individually tailored paper-based exercises following clinical assessment at home and (optional) 1st exercise session in-person, weekly phone/virtual call Pathway 3. Traditional Declined or unsuitable for Pathway 1 or 2 so waited for return of traditional clinic-based group rehab programme which restarted Nov 2020	The three pathways were successful and will continue in the long-term. The remote pathways worked well, particularly for those who were still working as it could fit around work patterns. Outcomes and satisfaction were similar across all pathways. There were few technical issues but the team put a lot of work into preparing resources beforehand. They had time to do so as referrals dropped during the pandemic. The team used lockdown as an opportunity to move towards being a paperless service.
11	At lockdown, clients disappeared as they were not travelling to the city centre to work, and gyms were closed. Uncertainty was high and how the restrictions affected physiotherapy service was unclear. It was also unknown whether private medical insurance would cover remote delivery.	The practice had to find new referrals and 'pivot' to deliver care remotely. An agile response and good leadership led to success. A reliable platform and digital system was essential, which actually increased the practice's reach as they could now treat patients anywhere in the country and occasionally abroad. In the long-term the practice intends to continue a mainly remote service and are unlikely to re-open all of their clinics.

12	All outpatient appointments were cancelled immediately. The PT team were split into two teams to minimize the number of people in the hospital. They rotated bi-weekly to cover inpatients. Within 12 weeks, Zoom was set up to cover outpatients needs and was approved by the trust. Patients who had missed their review was contacted and appointment made for review by Zoom or phone.	Working remotely enabled the service to continue as most patients were shielding. Videoconferencing gave PTs an insight into patients' home environments (previously only clinic based), which was advantageous, as were savings in transport costs for patients and the trust. For new patients, remote PT was considered less useful or appropriate (a sentiment shared by many other case studies). They have now mainly moved back to in-person clinic appointments but will offer a blended approach when it is the patient's preference.

Table 4.3: data collected from each site

Site	Patient outcomes	Patient satisfaction	Staff satisfaction	Uptake and attendance rates	Resources- Time and cost of delivering remote PT	Documentation
1		Email or phone questionnaire before remote appointment, asking about the patient's expectations and experience of remote care and referral route.	Notes from staff meetings produced 'learning and reflections on remote delivery'; 'staff training needs' and 'how to improve' Staff satisfaction survey.	Did Not Attend rates recorded for each mode of delivery March- Dec 2020 Discussed in interview	Discussed in interview	SOP for remote delivery Video conferencing competencies Virtual management plan flow charts for new patients and follow-ups.
3		Discussed in interview	Staff questionnaire re: remote (phone) delivery.	Discussed in interview	Discussed in interview	
4	Team led audit of the remote service April - July 2020: Discussed in interview	Patient satisfaction survey Discussed in interview	Staff satisfaction survey.	Uptake of different modes of treatment Discussed in interview	Time taken	Triage criteria for the remote service
6	1563 patients from March 2020- March 2021: type of	34 responses to online questionnaire.		Discussed in interview	Discussed in interview	Risk assessment for remote group

	therapy; demographics; amount of therapy; no. of contacts; outcomes (Barthel Index; Rankin Scale; Goal Attainment Scale and Nottingham Activities of Daily Living					exercise classes Activity plans for remote groups
7			Yes- report /reflections	Proportion of patients treated F2F and remotely Discussed in interview	Additional hours to set up and deliver remote care Discussed in interview	Remote therapy (videolinks) guidelines
8	~2/3 of patients randomly selected for assessment (in-person) with Berg Balance Scale; 30s STS; and FES-I for comparison with outcomes for in-person care. Patient demographics also recorded	Online survey before start and after discharge.	Online survey	Attendance rates recorded Discussed in interview	Discussed in interview	Remote class exercise booklet.
9	Intermediate care- no data available MSK -One PT who recorded patient characteristics and treatment requirements for remote care 8 weeks Dec 2020-Jan 2021.			Remote therapy attendance rates recorded. Discussed in interview	Time taken to deliver remote PT recorded Discussed in interview	Decision- making tool for who is offered remote PT and referral pathways Virtual group Standard operating procedure
10	Demographics and outcome for the remote pathways recorded. Outcome measures = COPD Assessment Test, Chronic Respiratory	Satisfaction with the remote pathway recorded on 5-point Likert scales (very poor 0 to very good =4).	Report from reflections during staff meetings	Uptake and completion rates. Discussed in interview	Discussed in interview	

	Disease Questionnaire, MRC Breathlessness Scale, 60s STS and hand grip strength.					
11	105 patients discharged between Nov 2020 - Jan 2021 reported change in pain score (0-10), and discharge destination.	23 returned patient satisfaction survey in April 2020.		Attendance rates recorded Discussed in interview	Discussed in interview	Remote video process document

Uptake of remote physiotherapy

When lockdown started, all services started to offer remote care. Some contacted all patients and offered them a remote appointment. Others, with a more disabled client base screened the patients and offered remote appointment to those they felt may be able to manage them. Four sites provided objective data about the uptake of remote physiotherapy and the proportions doing so were mixed; ranging from 14% (Site 1) to 53% (Site 6). Several sites noted a proportion of patients who declined physiotherapy after lockdown (70% in Site 1's case). However uptake increased over time. In the interviews, participants described how, as everyone became more familiar and confident with using technology and doing things working remotely, numbers increased.

> *'…when we looked back at the numbers and the feedback, there was some indication that the more people used it, the happier they got with using it.' (Site 4).*

As time went on Site 1 were seeing *"about 30%"* of their patients remotely; for Site 2 it was *"nearly half"*. All services who considered the issue stated that some patients preferred using the telephone to video calls, and uptake of both was greater than using specific apps or NHS platforms.

After the first initial lockdown the sites were offering blended, rather than solely remote services and much of the interviews were taken up with discussion about what aspects of physiotherapy could, or could not be delivered remotely and for whom it was, or was not suitable. Views varied depending on the service's clientele and the type of physiotherapy offered, but broadly echoed those expressed in the survey (Chapter 3). It was generally agreed that triaging patients by phone or video was necessary to ascertain whether remote delivery was suitable for them and their interest in it. Also remote delivery was not suitable for patients who had no access to technology (even a phone in some cases). For individuals with certain impairments remote consultation created barriers to participation. Similar barriers where identified for individuals who do not speak English; leading physiotherapists to seek alternative consultation delivery. Concern for the safety of people with mobility and balance problems or at risk of falls led some services to avoid seeing these patients remotely unless there was someone to offer assistance. Other cautions were situations when the physiotherapist needed to touch or see the patient in order to assess or treat effectively. Many noted that although patients with *"basic"* or *"straightforward"* problems could be seen remotely, those with more *"complex"* problems needed to be seen in-person. Examples given

were ‘red flag assessments’; hands-on neurological assessment and treatments, and acute injuries. However many were careful to point out that there were no hard or fast rules about when remote delivery should or should not be used – it needed to be considered flexibly on an individual basis, depending on the patients’ needs and preferences, with an option to be seen in-person if remote care did not suit them. Some felt this had an unexpected benefit in that it promoted individualised, patient-centred care as each patients’ needs and preferences had to be considered in detail. This led some to reflect that it had promoted a more patient-centred approach to their practice:

> *“It’s about establishing early on, what a patient wants….. It’s about what is tailor-made for the patient…. And it’s got to mean something to the patient, so we can reflect what we’re doing…. I think that’s one massive thing that COVID’s taught me, is it’s got to mean something to the patient.” (Site5).*

Flexibility, compromise and imagination were needed to find ways to overcome difficulties. For example, to accommodate the need for objective assessment, Site 8 (pulmonary rehabilitation service) saw all patients in-person for their initial assessment (at home) but then delivered the treatment remotely. In contrast, some services took up patient reported assessment and outcome measures which could be completed remotely. Others valued remote consultations for ‘follow up appointments’ to monitor progress but delivered other aspects of care in-person. All services that used it, reported that remote delivery enhanced self-management of long-term conditions as it encouraged greater self-reliance and problem-solving.

> *“Self-management. Now that is one of the big advantage I noticed in this last year with doing video appointments. People are realising “I can do it in the home, so I don’t need to come in. Perfect.” (Site 2).*

None of the services assessed digital exclusions per se but the data above gave an indication of the proportion of patients who for whom it was a possibility. As detailed below, a proportion of patients were unable to access remote care because they did not have access to suitable technology (phones, internet access, etc); were digitally ‘illiterate’ or were too disabled to manage it. However, no objective data were available.

Another important issue regarding uptake of remote physiotherapy is attendance, i.e. whether patients continue to attend physiotherapy appointments (often referred to as ‘Did Not Attend’

or DNA). Site 1 provided detailed information about attendance with data for new and continuing patients from March-Dec 2020. In April 2020 (as lockdown started) 'did not attends' rose to 45% but then settled at a much lower rate (4-9%). Adherence to follow up appointments was also good with only 10-17% 'did not attend'. In their interview, the lead physiotherapist explained that the increased DNA rate in April 2020 was probably because the way it was recorded changed. Sites 4,5,9,10, and 11 all noted increased attendance compared to before lockdown. Site 6 attributed their 10-25% drop out rate to patients (with chronic lung disease) becoming unwell, rather than dissatisfaction with the service. Some attributed this improved attendance to lockdown and patients having fewer competing demands on their time. For example, Site 1 noted that attendance fell when the 1st lockdown eased in Summer 2020 when

> *"People felt the pressure of having to go back into a work environment and not prioritise an appointment".*

While others attributed it to greater ease of contact: *"Personally I got less DNAs [Did Not Attends]. I think if somebody wasn't going to be there for a video call…they're more likely to tell you…whereas clinics, people just don't turn up if they don't want to" (Site 4).*

Patient outcomes

Two sites (sites 6 and 8) provided data on patients' outcomes. One provided data for blended delivery, but where video or telephone was pre-dominant (site 6) and was compared to in person traditional delivery on patients seen during the pandemic. The other site provided data on patients who attended completely remote physiotherapy groups apart from in person initial assessments, compared to patients receiving traditional in-person care prior to the pandemic (site 8). Neither showed any difference in outcome with different modes of delivery (where there were better improvements in one outcome for one mode, there were other improvements for other outcomes for another mode of delivery).

Table 4.4: Site 6 outcomes

	In-person	**Telephone**	**Video**
	Change	**Change**	**Change**
Barthel Index	1.99 (SD 3.4)	2.0 (SD 3.3)	2.1 (SD 3.7)
NADL	16.2 (SD 12.5)	16.7 (SD 12.5)	20.7(SD 12.6)
Rankin Scale	0.88 (SD 0.9)	0.92 (SD 8.5)	0.93 (SD 0.8)
Goal Attainment Scale N=415	16.84 (SD 8.2)	16.9 (SD 8.2)	17.8 (SD 9.0)

Barthel Index = measure of activities of daily living n=381; NADL = measure of extended activities of daily living, n=425; Rankin Scale = measure of disability, n =383, goal attainment score n=415

Table 4.5: Site 8 outcomes

	Remote service N=23	**Face to face service N=66**
Number of falls during sessions	0	0
	Improvement between baseline and discharge	
Berg Balance Scale	Mean: 3	Mean: 7
30 seconds sit to stand	Mean: 3	Mean: 2
Falls Efficacy Scale (FES-1)	Mean: 4	Mean: 1

Patient Satisfaction

Six sites presented data from formal assessments of patients' satisfaction with physiotherapy after lockdown and the move to remote/blended delivery (Sites. 1,4,6,8,10 and 11). They all used questionnaires but the questions asked and the scoring methods varied. However, whatever type of physiotherapy provided and however questions were asked, patients' satisfaction was overwhelmingly positive. For in-person consultations, the advantages were that the patients felt assessments and treatment were more accurate when the clinicians could see or touch them. Many also preferred to see someone in-person, which they felt was *"more personal*" and aided communication, especially for those who were hard of hearing. Several patients also felt more confident that they had learnt exercises (and followed other advice) more effectively when it was taught in-person.

The disadvantage of in-person care were safety concerns about having contact with another person or travelling to a hospital during lockdown. The advantages of remote care was that it enabled patients to receive physiotherapy during lockdown, when they the service would otherwise be shut. This was particularly important for patients (and some staff) who were shielding. Although many (~66%) saw remote delivery as a means to an end and would prefer to return to in-person consultations when possible, many patients found the convenience of remote consultations a great advantage. It was quicker, easier and cheaper for patients without needing to find (or pay for) parking, and take time away from work or other commitments. It was also welcomed by patients with high pain levels and anxiety, and patients who might want to discuss sensitive issues. However some people felt apprehensive about a new way of working and communicating, others did not have access to the technology or experienced technical problems such as slow internet connections; and

difficulty positioning the phone or camera to get a good view. For some, remote group sessions were a welcome opportunity to 'meet' with other people when they were otherwise isolated during lockdown, but others felt that they missed out on the peer support and social contact that was gained by interacting with others with a similar experience in-person.

Staff Satisfaction and Experience

Four sites (sites 1,3,4 and7) had formally evaluated staff satisfaction and experience of the move to remote/b delivery via questionnaires, workshops and reflections on learning and how things could be improved. Inevitably, feedback from staff tended to reflect on the experience of working through the pandemic, rather than specifically on working remotely and on issues which were specific to their situations, but generally feedback was positive. Although one frustrated interviewee exclaimed that they could *'count on one hand'* the number of successful video calls they had had with their platform.

Staff highlighted how working remotely enabled the service to continue and in some cases were surprised how much could be done, and how effectively one could communicate and build up a rapport remotely. Some found it a welcome opportunity to reflect on the way their service was organised and that pulling together in a crisis enhanced team spirit and camaraderie. The negatives were:

- difficulty carrying out assessments and supervising exercise remotely
- poor or unreliable connectivity/band width
- insufficient numbers of computers, ipads, phones supplied by employers,
- lack of space and privacy,
- the need for regular breaks when working virtually (one respondent likened it to working in a call centre)

Sites delivering group sessions noted that two people were needed, one to guide the patient interaction and one to deal with any problems that arose- as would occur during in-person delivery. Remote delivery required a lot preparation and resources had to be developed to ensure sessions were safe meaningful and realistic. Time and resources for this needed to be found. For private practices, fee structures had to be adapted to accommodate the change in costs. Site 1 is in a very multi-cultural area and regularly needed to work with interpreters which brought additional challenges to organising a three-way conversation virtually, when language skills were limited, however they noted that this because easier with practice.

Several interviewees also highlighted how hard work it was to deliver blended physiotherapy, describing doing both in-person and remote consultations as *"like having two jobs"* which was exhausting. Those working remotely also noted that they missed having everyday conversations and sharing knowledge and experiences with colleagues.

Professional Identity

In the interviews, participants reflected more broadly about the impact of remote working on their professional identity as physiotherapists, with several expressing frustration that working remotely meant they could not use their expertise and specialist skills, particularly for assessment and 'hands-on' treatment, which meant that patients received less effective care. As Site 6 explained *"my hands aren't going to be on them, how are they going to do this pure movement pattern?"* Others felt that changing to remote delivery was not 'real' physiotherapy and required skills and a way of working with which they were not comfortable and this negatively impacted on their job satisfaction:

> *"I'm not IT savvy, I'm a physio. I'm a doer" (Site 5)*
> *"You didn't really sign up to physio to be a desk job really". (Site 9)*
> *"Physiotherapy is all about touch and that's an alien concept - being virtual" (Site 1).*

In contrast, others felt that one's way of working and attitudes needed to be adaptable to changing circumstances and that they had progressed professionally

> *"We haven't got our hands, but we're motivators, facilitators, problem-solvers, movement analysers, teachers…I think we have certainly reflected that…We've all said "I thought I was a good teacher, but I've become a better teacher." (Site 7).*
> *"Now you look back …why weren't we doing phone calls and stuff? It was just tradition. It wasn't really questioned…you just do it…you know, that's physio" (Site 9)*
> *"This isn't about me, this is actually about a patient ….If I can help them …I've got to take away some of my beliefs and… make this work for all of us." (Site 11)*

Effective Leadership and Organisational support

Two important factors, which influenced therapists' experience of remote working were effective leadership and organisational support. The participants (most of whom led the implementation of remote working) described how they needed to lead 'from the front' and be enthusiastic about the opportunities that remote working offered and a 'can-do' approach to dealing with challenges.

> *"In any team you probably have your drivers … there was a few of us who were like …"we've got to do something here" (Site 1).*
> *"Successful services are just enthusiastic. Just like… this is a massive opportunity" (Site 6)*

To achieve this, flexibility was recognised as an important element as this rapid and extensive change needed to accommodate staff with many different degrees of experience, skills, appetite for change and personal circumstances. Leaders needed to be able to manage the team dynamics, involve the whole team, collaborate with others, acquire resources (support, training, equipment etc.).

> *"It [developing triage and screening processes] wasn't top-down. We've all gone, "Okay, let's do that". There was a discussion between me and the team to look into how we can implement this". (Site 4).*
> *"Some staff really have run with it, loved it, and welcomed it with open arms. Thinking, it's a brilliant other way of supporting the patients. Others have got frustrated with the platform, and …. lost confidence …. and then it's just easier to be a bit old school and do it over the phone" (Site 3)*
> *"There have been so many transitions, I am now recognise those team members who thrive on change and those who don't….. They've needed a lot more hand-holding and a lot more guidance and support. Whereas other team members have just accepted it. What's been difficult for all of us, is that the change has been constant". (Site 7)*

Closely connected with the local leadership was the organisational support. Experiences were mixed, with reports of slow responses and lack of guidance that hampered progress. Many services felt they needed to work things out themselves.

> *"A lot of the barriers were lifted but it was still very slow, like walking through sand. Then you have people who potentially don't want to do those things anyway. Well, it is difficult. … You were kind of left to your own devices, which did mean you were*

able to innovate, but also it's made everything really difficult and time-consuming and long-winded. …. For example, every leaflet, every bit of patient information has to go through governance". (Site 6)

"This is where I mention the red tape. From an information governance perspective, it took us well over six weeks to get an agreement that we could use Teams with our patients….although the team were proactive in ordering technology …. It still hindered delivery [of remote interventions]" (Site 1).

Accessing sufficient resources to deliver remote physiotherapy was a particular issue: many departments were too small for all therapists to work together and maintain social distancing which led them to consider working from home. This was a boon for some, but not others

"We couldn't socially distance, so people had to trial home working. Some staff [wanted to do so] but others if they live on their own, "I don't want to be at home on my own". (Site 1).

Reports of difficulty obtaining basic equipment such as laptops/tablets, headsets, webcams, landlines, desks, chairs, were common and a source of frustration:

"I think about early January I picked up a laptop stand, laptop, mouse, mouse mat, so yes, I do have the equipment - now". (Site 10).

Site 1 were so frustrated that they reported the lack of resource as a 'critical incident' that was affecting patient care:

"Due to Covid-19, the MSK Physiotherapy service is only able to provide appointments using telephone or video. Video is the preferred option for patients however connectivity in the physiotherapy department is poor and patients may be disconnected. When this happens the physiotherapist contacts the patient immediately by telephone to complete the consultation. However, due to poor connectivity calls can only be completed using a landline, as mobile phones often lose connection. There is currently only one landline for 20 clinical staff to use at the hospital. Six separate IT requests have been submitted over the past 4 months and all are still outstanding. Negative feedback from two patients.

However not all experiences were negative, some sites felt that they were well supported and provided with training

> *"To be fair, the trust has been very good. We've had a lot of courses to go on to do IT and stuff, a lot of people to ask…I've got five iPads that we can loan out to patients now, which is really good, and some dongles with some Wi-Fi on". (Site 5)*

Resources.

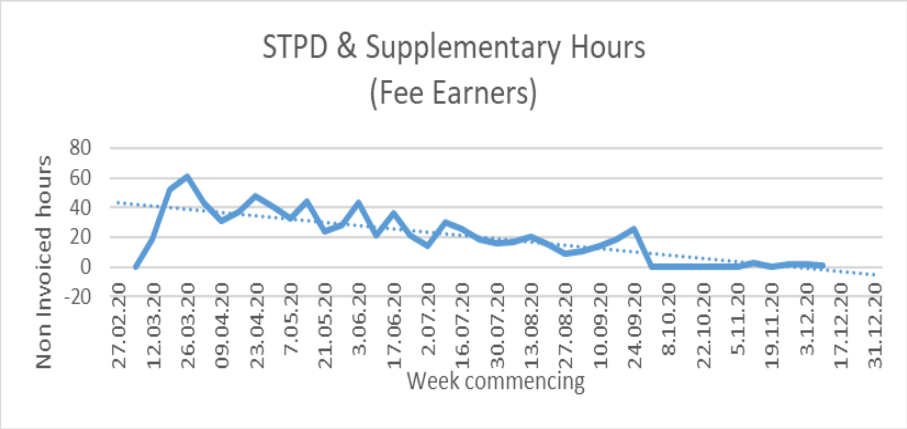
Cost

We had hoped to objectively measure the time and costs of providing remote or blended care and to compare this with traditional in-person delivery. However, these data were not available. None of the sites collected data regarding the cost of delivering remote or blended physiotherapy, however Site 7 noted the need to develop new charging processes to capture the new ways of working

> *"Because we're a business we're on a constant time and motion kind of thing, because we have invoiceable activities and we obviously have non-invoiceable activities [where we had to create new categories]"*

They recorded the additional hours they had worked to organise, deliver and then reflect/ problem-solve and record remote physiotherapy. Initially, this included a lot of time negotiating with case managers and insurance companies about funding for remote therapy. It shows that initially, huge amounts of time (up to 60 hours per week in March 2020) were spent on this non invoiced activity, but it reduced back to zero (in October 2020) as systems became established.

Figure 4.6: Hours of work to implement remote physiotherapy sessions which were not invoiced at Site 7



Although it was not costed, interviewees highlighted the immense work needed to prepare for remote delivery. In many cases, this involved the team working together in new ways to *"think outside the box"* and including patients from the outset to ensure the outcomes were user-friendly. Careful preparation was essential; interviewees highlighted the need to *"plan, plan, plan and practice, practice, practice".* It took time to research and make decisions about which platform to use. The complexity of deciding whether remote delivery was appropriate for each patient was reiterated. Services had to ascertain whether remote delivery was suitable for the patient: whether they had access to the necessary technology; were able to use it; were in a safe environment to do so; whether assistance was available (when necessary) and whether remote assessment and/or treatment was appropriate for their condition and level of impairment. Finally, the patients' preference whether to take up remote consultation was key. Not only was this time consuming to complete on a day-to-day basis, but it also required a great deal of work to develop, pilot and refine effective processes and materials including

- triage and screening tools;
- risk assessments and procedures to how to deal with and/or prevent emergencies or adverse events;
- adapt assessment processes and outcome measures
- refine treatment programmes
- produce new support materials
- acquire funding and equipment when necessary
- establish training materials and programmes.

Although some sites were able to use 'off the shelf' apps, most of the procedures and processes were developed in house by trial and error. In some sites, this was extensive. For example developing booklets to explain the service, and supplement the exercises including written material and a YouTube Channel

Other services noted that they needed to work out how to adapt the working day to accommodate remote working. For community staff, working remotely meant a reduction in time spent travelling which was previously used to defuse/ reflect and problem-solve and so other times for these thought processes needed to be found. Many services noted that remote working was intensive, requiring great concentration and regular breaks. One interviewee likened it to working in a call centre, which is not the type of job they *"signed up for"*.

> *"There had to be some kind of policy around giving some break in between patients. You can't just roll from one to the next to the next… you need at least 15 minutes in between. And lunch breaks… It has been very tiring…There's a lot to learn about how to do this effectively in terms of promoting team building, how to look after yourself during this time". (Site 6).*
>
> *"One of the things is the screen time. I've found the last two or three weeks really, well it's quite intensive work" (Site 8).*

It was also useful to have someone (sometimes an administrator or assistant) available to deal with any technical problems and to establish a backup technology (usually telephone) in case of connection or technical failure. Interviewees were also conscious of the need to accommodate non-clinical policies such as data security and patient confidentiality, safeguarding and health and safety.

Time

Even when remote working was established, it could not be assumed that it would be less time consuming than traditional care. One site noted that new assessments which usually took 30-45 minutes took about an hour when delivered remotely, but participants also noted that speed and effectiveness improved with time as skills and confidence grew. Two sites provided objective information about the time spent delivering remote physiotherapy. This was most detailed in Site 9 (musculo-skeletal). First appointments were mostly delivered by telephone (N=54, 87%). On average, 117 minutes was spent on new patient consultations (22.6 minutes preparation; 34.8 minutes in the consultation; 43.8 minutes writing clinical

notes and 15.5 minutes arranging additional resources). For 'follow up' patients (n=81), on average 51.3 minutes was spent on each appointment, most of which were by telephone (n=70, 86%), with 7 (9%) by Attend Anywhere and 4 (5%) through email. The service had not measured the time taken for appointments in traditional in-person care so direct comparison is not possible. The additional time required for preparation was acknowledged, which was much less during traditional in-person care.

Site 6 compared the amount of therapy provided (in terms of the number of hours and minutes of therapy) with different models of delivery and showed that patients tended to receive shorter treatment sessions by video and telephone than sessions delivered in-person (Table 4.6). Note, this comparison did not take into account any differences in characteristics of patients who received different modes of delivery and therefore those seen in person may have had more complex needs.

Table 4.6: Amount of therapy delivered with different modes of delivery in Site 6.

	Face-to-face (n=541)	**Telephone (n=482)**	**Video (n=145)**
Median (range) amount of time of treatment	9 hours (5 minutes -138.6 hours)	2.5 hours (5 minutes -27.6 hours)	3 hours (10 minutes -42.7 hours)

a Median reported as data is very skewed

Patient 'Incidents

Although adverse events or 'patient incidents' are routinely recorded by clinical services, few data were obtained. Overall, this indicated that remote physiotherapy was safe. Site 8 recorded falls in their group exercise sessions but noted that none occurred regardless of mode of delivery. In the interviews, several sites confirmed that they had not had any patient 'incidents' while delivering remote physiotherapy. Site 1 provided formal data on patient 'incidents' but none were directly related to patient safety during remote physiotherapy consultations.

Finally we asked each interviewee for their 'top tips' for successful implementation and delivery of remote physiotherapy consultations. These are summarised in Table 4.7 and reiterate many of the points raised above.

Table 4.7- Top tips for delivery

Planning delivery	• Develop and pilot protocols and processes beforehand – especially to deal with 'concerns' eg risk assessments; triage; assessment; treatment protocols. Who does it work for?
	• Plan, plan plan
	  o with each other
	  o what is best way to deliver
	  o share examples of success
	  o how to approach certain interventions/ conditions/challenging issues.
	• Think about what you can do,
	  o think outside the box,
	  o do not try to deliver remotely as you deliver in-person - you have to adapt.
	• 'Buffering time' is required between appointments, as it is difficult to manage time during back-to-back virtual appointments.
	• User-friendly software aids success,
	  o Have different platforms or phone calls as backup.
	• Be flexible in your approach
	• Be prepared BEFORE appointments (know exactly what you can and will do)
	• Do not assume participants cannot engage based on age (older/young)
	• Be individual patient-led in what you do and how you do it.

Delivering remote physiotherapy	• Where possible involve administrators or rehabilitation assistants to:
	  o research different technologies to use.
	  o help set up the call before the physiotherapists gets involved
	  o make virtual PT appointments to guide, trouble shoot and discuss expectations with patient.
	• Use resources to support set-up with an information page or leaflet sent by email or post
	• Explain how the initial assessment will work by phone or video, including that they

	○ need to be ready 15 minutes beforehand. ○ should to be in a safe and appropriate place to conduct the session • End the call if not safe to carry-on. • Ask where they are (location address) at the start of the session so contact can be made if necessary. • Have a 'positive' attitude, especially with patients to encourage their uptake, your confidence makes them confident.

Discussion

The case studies have reiterated the findings in the previous chapters that remote/blended physiotherapy is safe, feasible and acceptable to patients who access it and to staff when delivering it to these patients with similar outcomes to in-person care. We carried out four workshops with patients, other physiotherapy sites and academics who confirmed our findings (Appendix 4.4), with no deviation in experience. However it was very clear that remote physiotherapy delivery was not suitable or accessible for all patients or all clinical situations. In the long term, a blended approach was preferred where in-person and/or remote delivery is offered according to the patients' clinical and technical situations and their preferences.

Remote consultations were mostly delivered by phone or video and were valued for initial triage and for 'follow up' appointments to monitor patients' progress. It was acceptable for patients requiring straight forward assessment and treatment and had a helpful role to play supporting self-management of long-term conditions. It was less useful for patients requiring with objective assessments and patients with balance or mobility difficulties, requiring dynamic exercises involving potential balance risks, or for individuals with certain impairments for whom remote consultation created barriers to participation, such as how to use the technology. Similar barriers where identified for individuals who do not speak English as their first language. Views about whether it saved time for staff were mixed. Although there was clear support for holding meetings remotely to reduce travelling costs and time, others found delivering physiotherapy remotely was more time consuming than traditional in-person care because of the additional preparation and patient support that was

needed. However a clear advantage for patients was greater convenience by accommodating work and other commitments and saving time and travel costs. We had insufficient data to draw any conclusions about cost or clinical effectiveness, or digital exclusion although physiotherapists did mention patients were digital excluded from participation in remote physiotherapy in the interviews. These findings broadly concur with other overviews and studies of remote physiotherapy and/or remote care in response to the pandemic [2-8].

This study has also illustrated how moving to deliver physiotherapy remotely in response to the Covid pandemic required a rapid and disruptive change that challenged some physiotherapists' professional identity and job satisfaction, although others considered it a positive opportunity to review and improve their service. Interviewees highlighted the importance of thorough planning and preparation to ensure remote consultations were effective and safe and to deal with any problems that arose, but also to ensure the 'remote workload' and working environment was acceptable and sustainable. More often than not, participants felt they had to adapt their service at short notice with little support from their employing organisation. Most felt they had to 'work it out for themselves'. The success with which these changes were made depended largely on effective local leadership [9]. Where this was successful, the leaders demonstrated features of a transformational leadership style by acting as role models with an inspiring 'vision', encouraging staff's personal development and to be creative and innovative [10]. This leadership style has been associated with effective change management and enhanced patient outcomes [11,12]. Whether these effective leaders were naturally drawn to this approach or whether it was as a result of leadership training and personal professional development is unknown.

Limitations

We carefully purposively sampled the participating sites to ensure all the main clinical areas, and settings were represented. Although we attempted to recruit sites from all four countries of the UK, all participants were from England, which may limit generalisability to the 'devolved' countries. However, we did represent Welsh and Scottish sites and a mental health site (not represented in our case studies) within our workshops where our findings were confirmed (appendix 4.4). Also our attempts to collect standardised data to allow pooling between sites and comparison between remote and in-person delivery were stymied by the 3rd lockdown and challenging timescales for the evaluation. Thus we had to use the data that the sites routinely collected and were able to make easily available to us. This limited the

analysis, however the consistency between the findings reported here and those from Chapter 2 and 3 gives us confidence that that findings are a realistic representation of remote physiotherapy delivery in the UK.

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CHAPTER 5: OVERALL DISCUSSION and CONCLUSIONS

The overall findings of this evaluation are that remote/blended physiotherapy is safe and comparably effective to in-person care for the patients able to access it. There is limited evidence of effectiveness in some areas and settings of physiotherapy. For those patients who have been able to access remote physiotherapy during the pandemic so far it is mostly perceived as safe, feasible and acceptable. The scoping review (Chapter 2) indicated that remote/blended physiotherapy is effective and safe across some clinical areas, but with little evidence in others and of implementation into practice, especially in the UK. Chapters 3 and 4 have provided evidence of real-life implementation on a national scale. Their findings support those from the scoping review (Chapter 2) that remote/blended physiotherapy is safe, feasible (for some, but not all patients), acceptable (for patients who choose to access it and can access it). We have very limited data on patient outcomes for remote/blended delivery but where they have been provided they are broadly comparable to in person delivery. In the review and case studies, it was noted that the remote physiotherapy delivered often included some degree of in-person contact on an individual and/or service level. Thus, it might be more accurately described as a blended service model.

Throughout the evaluation, implementing remote physiotherapy has been a matter of weighing up 'pluses and minuses'. The advantages of the rapid move to remote physiotherapy during the pandemic has been that physiotherapists were able to continue delivering a service during lockdown and developed new skills (or refined existing ones), adding to their 'toolbox' of options for patients. Although for many this was a 'stop-gap' in response to the pandemic and lock-down, for some it provided an opportunity for reflection and led to positive changes towards more person centred care.

Remote delivery increased reach in some areas so patients who did not previously have access therapy can do so, thus improving equity of service. However, it only suitable for those with access to suitable technology, internet connections and the knowledge about using the technology thus decreased reach for others, who are often be amongst the most vulnerable and disadvantaged, exacerbating health inequalities [1].

Remote consultations can be helpful to triage and 'signpost' patients and for 'follow up' appointments to monitor progress. It can also promote self-management for people with long-

term conditions and patient-centred care by improving communication and understanding of the patients' environment, needs and preferences [2]. The negatives are inaccessibility for those without access to technology (even a phone) or for individuals with certain impairments for whom remote physiotherapy creates barriers to participation- such as a need to understand how to use the technology: Similar barriers where identified for individuals who do not speak English. It was also less successful for objective assessment as it can be difficult to get a clear view of the patients to complete assessments or give exercise instruction. [3,4]. Its usefulness when working with patients or conditions where one needs to be able to touch to assess or treat effectively was also felt to be limited. It was clearly more convenient for patients, saving them the time and costs of travel for appointments and greater flexibility to accommodate work and other commitments. Although patients had a positive experience, physiotherapists and patient satisfaction data (survey and case studies) indicated a sizeable proportion preferred the 'personal touch' from in-person contact [5,6].

For staff, remote working saved time for community-based staff as they did not need to travel to patients' homes or to attend meetings (such as multi-disciplinary team meetings). However, clinic-based staff reported that it was often more time consuming as greater preparation was needed. We were unable to draw any conclusions about the costs of remote physiotherapy, but other studies have suggested that the costs and cost-effectiveness of remote health care, particularly in long-term conditions are similar, or slightly better than in-person care [7,8,9]. Further research is needed to assess the outcomes and cost effectiveness of remote and blended physiotherapy models after 'real-world' implementation compared to traditional in-person care.

Using the RE-AIM framework[10] our evaluation has presented both qualitative and quantitative data to demonstrate remote physiotherapy's **reach** into the population and some evidence of its **effectiveness. Adoption** and **implementation** on an organisational level within the NHS, private and other third sector providers have been demonstrated. What is not yet fully clear is how remote physiotherapy will be retained and **maintained** as the impact of the COVID19 pandemic recedes. However, all the interviewees indicated that they intended to continue using remote delivery (for some services this was through telephone only), with most combining it with in-person consultations in a blended approach. The use of emerging health technology implementation science frameworks, such as the Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework [11] may be useful

to inform the stages of maintenance and spread of remote physiotherapy, or its abandonment where it is found to be ineffective. This may help both service providers and policy makers seeking to identify and tackle the challenges to achieving long-term adoption and 'scale up' [11].

We noted a distinct increase in the confidence about delivering remote physiotherapy between the survey (Summer 2020) and case studies (Winter/Spring 2021). This is likely to be attributable to systems becoming embedded and growing skills and experience, It may also be because in all the case study sites, physiotherapists could see patients in-person if necessary (not always the case at the very start of the pandemic). This progression towards a blended approach enabling services to use remote delivery to enhance care for some, without disadvantaging others was welcomed. Participants in both the survey and case studies (Chapters 3 and 4) all intended to continue with a remote/blended approach to some extent, even after the COVID pandemic restrictions had eased. The challenge now is to understand the long-term adoption and outcomes. We advocate the use of theory informed, pragmatic evaluations of long-term adoption to inform the sustained use of effective remote/blended physiotherapy services at scale.

CONCLUSIONS

- Remote/blended physiotherapy is safe and acceptable for patients who take it-up.
- Remote/blended physiotherapy is feasible for those requiring straight-forward assessments and treatments not requiring physical touch or detailed view.
- Not all patients can access remote physiotherapy due to digital exclusion, it is also not easily accessible for individuals with certain impairments for whom remote physiotherapy creates barriers to participation.
- Although evidence is limited, it appears that remote/blended physiotherapy is comparably effective as traditional in-person delivery. However, more studies including cost effectiveness are required.
- It is particularly useful for triage, history taking and follow up appointments for patients without complex needs
- Effective leadership, appropriate resources, flexible approach and thorough planning are essential for success

- We recommend a flexible blended approach (combining remote and/or in-person delivery). Remote/blended physiotherapy should become an important part of physiotherapists' 'toolkit' to make physiotherapy available to as many people as possible; as much as possible; in whichever way suits them best
- The ultimate factors governing how to deliver physiotherapy are patients' preferences and needs. This patient-centred approach should be at the centre of decision-making.

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APPENDICIES

APPENDIX 1.1: Table A1.1 ADVISORY GROUP MEMBERSHIP

Name	**Job title and organisation**
Beelin Baxter	Physical Activity lead at Department of Health and Social Care (DHSC)- Attending for Dissemination only.
Professor Dawn Skelton	Chair of British Geriatrics Society Rehabilitation group
Anthony Gilbert	Chair of CSP Orthopaedics group
Kevin Duffy	PPI representative who took part in a research project on remote falls rehabilitation in 2016.
Jennifer Marvland	PPI Representative who took part in a smartphone app study around falls rehabilitation in 2019.
Caroline Birch	Manchester University Hospital Foundation Trust- Community Falls team lead
Gaynor McGinty	Service Manager for Integrated Contacts & Technology Enabled Care, Adult Social Care, Manchester City Council
Caroline Greenhalgh	Associate Director of Quality Governance, Manchester Local Care Organisation
Gabrielle Rankin and Fran Hallam	Project managers CSP

APPENDIX 2.1: WEBSEARCH IDENTIFIED RESOURCES

Briefing papers and guidelines

1.1. Physiotherapy Specific Briefing papers and Guidelines

1.1.1. eHealth to Improve Patients Care and Physiotherapy Services Briefing Paper. https://www.erwcpt.eu/file/237 This briefing paper from the General Meeting of the European region of the WCPT 2018 advises physiotherapists to support e-health by continuing with online CPD to broaden capacity and capability in e-health. They concluded that remote delivery benefitted patients with easy monitoring, motivated patients, and shorter waiting times.

1.1.2 Australian Physiotherapy Association Telehealth Guidelines Response to COVID-19. (March), 1–21. https://australian.physio/sites/default/files/APATelehealthGuidelinesCOVID190420FA.pdf Physiotherapy Board of Australia (the Board) and the Australian Health Practitioner Regulation Agency (AHPRA) published guidelines for physiotherapists in Australia with a framework for real-time (synchronous) video consultations to ensure the safety and quality of practice within the context of an emergency response to COVID-19. It included advice on:

- Informing and screening clients
- Client safety
- Client acceptance of remote methods
- How to prepare for a consultation
- Delivering a consultation
- Pricing/billing
- Trouble shooting guidance

1.1.3 Irish Society of Chartered Physiotherapists' Policy and guidelines on e-health for physiotherapists in private practice. (2020). https://www/hse.ie/eng/about/who/health-and=social-care-professionals/engaging-in-hscp-developments/ Remote physiotherapy was welcomed where it enhances service to the patient by enhancing patient-physiotherapist interaction, improving access to care and

facilitating reduction of costs. The document outlines what needs to be considered when providing remote physiotherapy, discussing benefits and challenges, and policies to abide by.

1.1.4 The Centre for Health Exercise & Sports Medicine, University of Melbourne produced guidelines to enable physiotherapists to advocate for funding for physiotherapy in Australia. The guidelines were drawn from a search of PubMed and professional organisations for English-language systematic reviews, controlled trials and qualitative studies and guidelines evaluating videoconferencing and telephone consultations by physiotherapists. **https://world.physio/sites/default/files/2020-11/Telerehab%20report.pdf**

1.1.5. Association of Chartered Physiotherapists in Respiratory Care produced a clinical practice guidelines based on a twitter-based survey of members in September October 2020 and a rapid review of literature which was produced and peer reviewed by 12 experienced pulmonary rehabilitation physiotherapists. Respondents delivered remote rehabilitation via video conference (50%), telephone support for unsupervised exercise programmes (63%) and rehabilitation via web-based platforms (50%).

Recommendations for setting up remote delivery services.

1) Follow British Thoracic Society Remote Pulmonary Rehabilitation Guidelines quality standards
2) Use existing products and services were possible. Consult IT about new products. Benefits include staff familiarity, reduce training costs, use of existing authentication processes and data management protocols (NCSC, 2020).
3) Adhere to your trust's clinical and information governance guidance where possible. New delivery methods need to go through local governance procedures (quality, data protection, equality & impact)
4) Consider resources requirements:
    a. Support needs to be available to enable staff digital literacy
    b. Workspace & equipment needs to be available for safe delivery
5) Carefully evaluate risk and benefits of service provision including feasibility & sustainability
6) Provide information and guidance for staff (standard operating procedure)

7) Communicate service changes to all stakeholders.
8) Discusses the requirements and advantages for video conferencing (Teams, AttendAnywhere, Zoom, Webex, OneConsultation, AccuRx) and Web-based platforms (myCOPD, SPACEforCOPD, remote-monitoring (eg CliniTouch Vie) and exercise prescription apps (egRehab Guru)

Risk assessment strategies

1) Constant review of the government regulations to ensure compliance
2) Conduct comprehensive risk assessment in line with latest guidelines & local policies
3) Regularly update standard operating procedures
4) For remotely supervised exercises:
    - provide equipment and relevant guidance, workspace & equipment risk assessment, use headset.
    - Conduct staff training needs assessment and provide support
    - Conduct patient risk assessment including individual risk assessments for group-based interventions
    - Inform patient about digital platform and allow test run, obtain informed consent and make patient aware of potential adverse events, obtain emergency contacts, ensure compliance with GDPR and advice against group session recording
    - review before and after the session using patient self-assessment checklist,
    - Conduct health inequalities impact assessment
5) Inclusion and exclusion criteria for remote delivery include.
    - Inclusion – suitable equipment/technology available; digital literacy to use equipment/technology; can follow instructions in English or have relevant support, able to consent and report adverse events
    - Exclusion- unstable cardiac or other condition, cognitive inability to follow instructions, significant visual or hearing impairment, impaired balance, risk of exertional desaturation
6) If maximum wait times are reached due to the impact of the pandemic, this must be logged on the local trust's risk register in line with local policy and procedure.

Workforce related issues and solutions:

1) Service sustainability during lockdown restrictions, managing service demand and waiting times are challenges. Consider providing remote pulmonary rehabilitation, home visits and outdoor group sessions wherever appropriate.
2) Provide training and support to ensure staff have the necessary digital literacy – which also boosts morale & support progression
3) Involve staff who are shielding staff and students (with support of educators) for remote delivery

https://www.acprc.org.uk/Data/Resource_Downloads/RemotePR_FINAL.pdf?date=26/03/2021%2009:04:07

1.2. Generic Briefing Papers and Guidelines

1.2.1. NHSE and NHSI - Clinical guide for the management of remote consultations and remote working in secondary care during the coronavirus pandemic (2020). https://www.nice.org.uk/media/default/about/covid-19/specialty-guides/specialty-guide-virtual-working-and-coronavirus.pdf Guidelines for clinicians and managers about delivering remote consultations and other ways of remote working in secondary care from NHS England and NHS Improvement, including when to use remote methods, a planning guide and delivery guide for staff, and patients

1.2.2. University of Oxford, Medical Sciences Division published a guidance for healthcare professionals and patients regarding the factors to be considered when deciding a video consultation is appropriate and how to prepare.
https://www.phc.ox.ac.uk/files/research/nhs_vc_clinician-faqs-covid-_a4.pdf.
https://www.phc.ox.ac.uk/files/research/nhs_vc_patient-quick-guide_a4.pdf/

1.2.3 The National Cyber Security Centre produced guidance to help you to choose, configure and deploy video conferencing services such as Zoom and Skype.
www.ncsc.gov.uk/guidance/video-conferencing-services-security-guidance-organisations

1.2.4 Rehabilitation in the wake of Covid-19-A phoenix from the ashes British Society of Rehabilitation Medicine (BSRM). ***British Society of Rehabilitation Medicine*****, (1), 293196.** https://www.bsrm.org.uk/downloads/covid-19bsrmissue1-published-27-4-

2020.pdf

British Society of Rehabilitation Medicine (BSRM) discusses how the rehabilitation response can capitalise on new learning to rebuild services on a better, more co-operative model to deal with complex rehabilitation needs.

1.2.5 British Thoracic Society Guidelines for Remote Pulmonary Rehabilitation Assessment https://www.brit-thoracic.org.uk/document-library/quality-improvement/covid-19/bts-pulmonary-rehab-remote-assessment/ includes a list of available video conferencing tools, procedures for physiological assessments (if the patient has access to the relevant equipment) for exercise capacity, muscle strength, balance, functional performance, breathlessness and quality of life. A safety checklist is also available.

2. Remote Physiotherapy Resources.

2.1 **Physopedia** provided information on providing remote assessment and treatment. https://www.physiopedia.com/The_Basics_of_Telehealth_Assessment_and_Treatment It addresses types of platforms to consider for video conferencing and data transfers, areas that require technical support, ways to prepare for tele-consultations including conducting pilot assessments, and additional questions to supplement observational virtual assessment and conditions where remote physiotherapy is effective. It also discusses effective strategies for patient education, delivering exercise therapy, recommendations for organisers and a patients' guide.

2.2 The **'Remote Rehab'** website (which aims to provide therapists with an online space to share and develop ideas for delivering rehabilitation services). They provide a presentation by two of the founders provides (Leanna Luxton and Gemma Hayden) regarding remote assessment, the evidence base, benefits and challenges, initiatives and surveys, and 'top tips'https://www.rrc.life/https://www.dropbox.com/s/e7al39f8s4jl24p/Remote%20Assessment%20.pdf?dl=0.

3. Surveys and reports on delivering remote physiotherapy

3.1 The Digital Physical Therapy Task Force (March 2020)

https://www.dropbox.com/s/kj6omfh0zzs8wt7/WCPT-INPTRA-Digital-Physical-Therapy-

Practice-Task-force-March2020.pdf?dl=0

acknowledged that remote physiotherapy can enable a wide range of service users to access physical therapy easily, in time and create better impact. The report details the global regulations, presents guiding principles for digital physical therapy practice and reports findings from a survey carried out in USA, Canada and the UK. Limitations of remote physiotherapy are highlighted including digital exclusion; lack of resources; non-suitability of remote service for certain conditions and risk groups, lack of funding and resistance by service user, professionals and disciplines; regulatory issues and access to equipment for training. The report also acknowledges the need to keep abreast of practice changes and technologies, developing new knowledge and skills with a focus on safety, efficiency and effectiveness. It further recommends that future work should explore the use of specific technologies (robotics, sensors, wearable devices, virtual reality, and artificial intelligence) by physical therapists and the role of social media in the profession.

3.2 Telehealth: A survey of the International Private Physical Therapy Association

(April 2020) presented data regarding how remote physiotherapy has been used https://world.physio/sites/default/files/2020-06/IPPTA_Telehealth_Survey2020.pdf

3.3 Ascenti- Investigating the effectiveness of virtual physiotherapy

https://www.ascenti.co.uk/news-article/virtual-physiotherapy-report

Ascenti are a large private physiotherapy practice (alongside other clinical services) based across the UK, who have provided 'digitally enabled' physiotherapy services for several years before the Covid pandemic. Anonymised data from 27,096 patients who accessed their virtual physiotherapy services before and during Covid-19 (up to 10 June 2020) were analysed. Of this population, 9,506 (35%) received virtual treatment only, while 17,590 (65%) received a mix of virtual and face-to-face care. These data were compared to a control group of 6,226 patients treated with in-person physiotherapy only. No details are given about whether the cohorts were matched, nor were their characteristics presented. The remote physiotherapy was delivered via video using the Ascenti Physio app, which also enables patients and clinicians to access videos and patient records within the call and afterwards at their convenience. Face-to-face physiotherapy was delivered in Ascenti's 300 community clinics including manual therapy, exercise prescriptions and advice without access to the Ascenti Physio app. Blended remote and in person physiotherapy including at

least one visit to a community-based clinic and access to online appointments and tools through the Ascenti Physio app. Key results were that 81% of patients were open to remote physiotherapy when recommended. All approaches produced similar reductions in pain (Numerical Rating Scale): on average, 3.6 for blended care; 3.4 for in person and 3.1 for totally remote physiotherapy. Patients' rated in person treatment more highly than remote; 97% satisfaction and 81% were 'extremely likely' to recommend the service to friends and family. The report concluded that remote physiotherapy was a viable alternative to in-person physiotherapy for all severity of injuries and conditions, whilst blended approach showed greater enjoyment.

3.4. Association of Paediatric Chartered Physiotherapists surveyed Paediatric physiotherapists' experiences during the pandemic. Most respondents reported their use of technology had changed with a shift to remote delivery using 27 different platforms. The most commonly used technology were Zoom (n=321) and Microsoft Teams (n= 235) for meetings; AttendAnywhere (n=160) and AccuRx (n=54) for virtual clinics. WhatsApp (n=88), Facetime (n=20) and Skype (n=49) were often preferred by patients and families. Remote service delivery was recognised as an asset that improved interdisciplinary team working, wider attendance at meetings and reduced travel time. The need to learn multiple technologies rapidly with little training; lack of confidence, knowledge and understanding of data security, technologies were issues, environmental interference, patient safety, service inequality and privacy were concerns. Most participants would consider continuing to use remote physiotherapy, mostly for follow up services.
18274 Paed. March 04 cover1 (csp.org.uk)

3.5. The **World Health Organisation** surveyed 194 Ministries of Health in May 2020. The results indicated significant disruption to prevention and treatment of non-communicable diseases due to the pandemic and recommended tele-rehabilitation where possible. https://www.who.int/publications/m/item/rapid-assessment-of-service-delivery-for-ncds-during-the-covid-19-pandemic.

4. Examples of practice

4.1 **Harefield Pulmonary Rehabilitation Unit Home Exercise Programme** was made available in the form of booklets. One for patients attending pulmonary rehabilitation and the other for professionals to deliver walking & strength training remotely.

https://www.brit-thoracic.org.uk/media/455109/harefield-pr-education-booklet.pdf
https://brit-thoracic.org.uk/media/455108/harefield-home-ex-prog-booklet.doc

5. Research projects

5.1. An ongoing research project on **'Remote Assessment and Management of People with Movement Impairment and Disability' at Plymouth University** was identified. It aims to create a toolkit and training package for health care professionals to enhance skills to deliver tele-rehabilitation, and facilitate effective management of backlog of people with disabilities in need of rehabilitation during the pandemic.
https://www.plymouth.ac.uk/research/centre-for-health-technology/remote-assessment-and-management-of-people-with-movement-impairment-and-disability

6. Patient blogs

6.1. A blog by Tina (livingwellpain.net) discusses potential changes to physiotherapy post Covid pandemic. https://livingwellpain.net/making-physiotherapy-even-better-post-covid-19- It mentions redeployment of physiotherapists into frontline practice and the shift from in person to remote service delivery. While discussing whether in person service should resume, the blogger opines that a 'hybrid' model (in person and remote care) is needed with access to technology and the internet, patient preferences being key considerations Some challenges with in person consultation are discussed; managing other commitments, time off work, cost, and long waiting period at the hospital/clinic. She would prefer the first session or when a physical examination is needed in person consultation and acknowledges the need to be aware of safeguarding issues including 'spams' or people pretending to be a clinician.

APPENDIX 3.1 SURVEY:

SURVEY:

Mapping remote/virtual delivery of physiotherapy services across the United Kingdom

Thank you for agreeing to complete this survey. You can complete it anonymously if you wish. The survey is part of a United Kingdom (UK) wide service evaluation commissioned by the Chartered Society of Physiotherapy (CSP) with an objective to map remote (virtual/ non-face to face) delivery of physiotherapy services (including telephone, teleconferencing, apps and other forms of remote delivery). This survey forms part of a larger more extensive service evaluation, which will identify sites to engage with to create case studies exploring service delivery in more depth. This evaluation will lead to recommendations for successful implementation to optimise outcomes including patient satisfaction. Completion of the survey does not commit you to engagement further in the evaluation.

All identifiable data will be anonymised and stored securely at the University of Manchester and with the CSP project team. The processing, handling and storing of data will be in accordance with the General Data Protection Regulation (GDPR) and Data Protection Act 20 18. Identifiable data is held for a maximum of three years after the project is completed and anonymised data will be held for a maximum of 15 years. On completion of analysis, a summary of findings will be published.

Demographics of your service

1. What is the main setting of your service
   a) Primary care
   b) Secondary care
   c) Tertiary care
   d) Community care
   e) Mental health care
   f) Independent healthcare provider
   g) Private healthcare company
   h) Private practice
   i) Social Enterprise
   j) Charity
   k) Hospice
   l) Other- if other please specify

2. Please indicate which of the following clinical specialities best describes the service you currently work in. Tick all that apply.

   a) Amputees
   b) Cardiac rehabilitation
   c) Care of older people

d) Children and adolescents
e) Community rehabilitation
f) Falls
g) Intensive/critical care
h) Learning disabilities
i) Mental health (adults)
j) Mental health (children and adolescents)
k) Musculoskeletal
l) Neurological
m) Occupational health
n) Oncology
o) Pain management
p) Palliative care
q) Pulmonary rehabilitation
r) Respiratory
s) Rheumatology
t) Sports and exercise
u) Stroke rehabilitation
v) Trauma and orthopaedics
w) Women's/men's health
x) Hand therapy
y) Other, if other then please specify

3. Where is your service located in the UK? Please tick from the list below.

a) England (based on NHS regional areas)
   - East of England
   - London
   - Midlands
   - North East &Yorkshire and the Humber
   - North West
   - South East
   - South West
b) Scotland (based on NHS Scotland Health Boards)
   - Ayrshire & Arran
   - Borders
   - Dumfries & Galloway
   - Fife
   - Forth Valley
   - Grampian
   - Greater Glasgow & Clyde
   - Highland
   - Lanakshire
   - Lothian
   - Orkney
   - Shetland
   - Tayside
   - Eleanan Siar Western Isles
c) Wales (based on Wales Health Board)

- Aneurin Bevan
- Swansea Bay
- Cardiff & Vale
- Hywel Dda
- Cwm Taf Morgannwg
- Betsi Cadwaladr
- Powys

d) Northern Ireland (Based on HSC trust areas)
- Belfast
- Northern
- South Eastern
- Southern
- Western

e) Channel Islands
f) Isle of Man

4. Do you deliver your service to patients living in a:

f) Rural setting (fall outside of settlements with more than 10,000 resident population)
g) Urban setting (towns, cities with populations more than 10,000)
Inner city
Suburban
h) Across both rural and urban settings
i) Other, please specify

Your remote physiotherapy services

The technology you use to deliver remote physiotherapy

5. a) If you use telehealth (virtual- video/audio) or teleconference (telephone), please state the name of the platform that you use. Tick all that applies.
Telephone
AccuRx
Skype
FaceTime
Zoom
Attend Anywhere
Microsoft Teams
SISCO Webex
Google meet
Lifesize
Pexip
Xuper/Visconn
Savience /HSL
Other, please specify

b) If you use or ask patients to use a technology for remote delivery other than teleconferencing (anything other than specified in question 5), please tell us its name (if it is an app used on a smartphone/tablet please tell us the name of the app e.g MyCOPD)?

c) What do you (service provider) call your service? E.g. virtual clinics/e-clinics /video conferencing/e-health

d) What do your patients call your service?

e) Have you involved patients/carers/family in developing your service?
Yes/No

The purpose of your remote/virtual delivery

6. Please tell us the purpose of the remote delivery that you provide (tick all that apply)

Screening and triage	
Initial assessment (or part thereof)	
Goal setting including review and progression of goals	
Deliver advice e.g. health promotion advice, safe transfer advice.	
Prescribe exercise	
Deliver exercise one to one	
Deliver group exercise	
Deliver education one to one Group	
Assess and review use of equipment	
Monitor and review progress	
Follow up and progress treatment	
To help with remote delivery tool e.g. session to specifically aid with the technology	
To provide self-management support	
Evaluation of outcomes/ treatment effectiveness	
Other- specify	

7. Are you able to define patient population and referral criteria for your service?
   Yes
   No

If yes, please specify.

8. a) Do you have a service specification or standardised operating procedures to guide delivery of remote consultations?
   Yes/No

   b) If yes, would you be willing to share it?
   Yes/No/Not sure

9. a) Do you provide student placements with your remote service?

   b) If yes, would you be willing to provide further information?

Evaluating your remote/virtual service

10. Does your service evaluate patient experience?
    Yes/No

11. If Yes, how is this evaluated?
    a) What outcome measures/tools/questions do you use?

    b) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

    c) Are you able to share your data with us?
    Yes/No/Not sure

12. Does your service evaluate patient outcomes (either self-reported or objective outcomes)?

    Yes/No

13. If Yes, how is this evaluated?

    a) What outcome measures/tools/questions do you use?
    b) Are you able to share your data with us?
    Yes/No/Not sure
    c) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

14. Does your service evaluate staff experience of remote delivery?
Yes/No

15. If Yes, how is this evaluated?
    a) What outcome measures/tools /questions do you use?
    b) Are you able to share your data with us?
    Yes/No/Not sure
    c) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

16. Does your service gather information on those who are unwilling/decline/unable to engage via remote/virtual routes? and the reasons why? e.g. are some patients excluded because of lack of technology, technology literacy etc

    Yes/No

17. If Yes, how is this evaluated?
    a) What outcome measures/tools /questions do you use?
    b) Are you able to share your data with us?
    Yes/No/Not sure
    c) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

18. Does your service evaluate the time it takes to deliver your remote service?
    Yes/No

19. If Yes, how is this evaluated?
    a) What outcome measures/tools/questions do you use?
    b) Are you able to share your data with us?
    Yes/No/Not sure
    c) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

20. Does your service evaluate cost of delivering your remote service?

21. If Yes, how is this evaluated?
    a) What outcome measures/tools/questions do you use?
    b) Are you able to share your data with us?
    Yes/No/Not sure
    c) Have the outcome measures/ tools /questions changed from before COVID?
    Yes/No

22. Has there been any patient related incidents reported while the service has been used (e.g falls, technology, software)?

    Yes/No

If yes, Are you able to share your data with us?
Yes/No/Not sure

23. Have you involved patients/families/carers in the development of any of your evaluation measures/tools/questions?
    Yes/No

24. If you have not currently done any evaluation of your remote service, do you plan to do any evaluation within the next six months?
    Yes/No/Not sure

25. Have you come across challenges in setting up remote services (trouble accessing technology or concerns about risk and professional judgement)?
    Yes/No.

26. Have you overcome those challenges?
    Yes/No/ in some circumstances

27. If you would like to comment on anything further within the survey, expand on any answers or your experiences then, please use the box below.

28. Would you be willing to be contacted about taking part in further stages of the project to allow us to explore your remote delivery further? This could include one or more of the following (just because you consent to further contact does not mean you have to take part). Please tick any that apply

    Taking part in an interview to help develop case studies

    Taking part in a workshop to discuss our emerging themes

    Providing further information, documents and/or data about your service

29. Would you be willing to be contacted about taking part in other CSP/University of Manchester projects about remote physiotherapy service delivery?
    Yes / No

If yes to question 28 or 29, then please leave name/email address below:

Table A3.1: LOCATION OF RESPONDENTS
Location of Respondents

Location of services	South East	245 (15.1%)
	London	196 (12.1%)
	Midlands	200 (12.3%)
England	North West	197(12.2%)
	South West	192 (11.9%)
	North East & Yorkshire	177 (10.9%)
	East of England	149 (9.2%)
Scotland	Ayshire & Arran	10 (0.6%)
	Borders	10 (0.6%)
	Dumfries & Gallaway	9 (0.6%)
	Fife	18 (1.1%)
	Forth Valley	15 (0.9%)
	Grampian	26 (1.6%)
	Greater Glasgow & Clyde	45 (2.8%)
	Highland	33 (2.0%)
	Lanarkshire	37 (2.3%)
	Lothian	33 (2.0%)
	Islands (Shetland, Orkney, Western Isles)	18 (1.1%)
	Tayside	14 (0.9%)
Wales	Aneurin Bevan	20 (1.2%)
	Swansea Bay	16 (1.0%)
	Cardiff & Vale	21 (1.0%)
	Hywel Dda	14 (0.9%)
	Cwm Taf Morgannwg	16 (1.0%)
	Betsi Cadwaladr	15 (0.9%)
	Powys	10 (0.6%)
Northern Ireland	Belfast	27 (1.7%)
	Northern	13 (0.8%)

	Southern Eastern	12 (0.7%)
	Southern	27 (1.7%)
	Western	9 (0.6%)
Islands	Channel Islands and Isle of Man	7 (0.4%)

APPENDIX 4.1: TABLE A4.1 KEY SELECTION CRITERIA FOR CASE STUDY SITES

Clinical area	Try to represent all key clinical areas. Also first contact practitioners and Discharge to Assess.
Site has some data on at least 2 of these parameters	Digital exclusion; Patient incidents, satisfaction and/or outcomes; Staff experience; Time to deliver; Cost of delivery
Include	Challenges setting up; Partially overcome; Not overcome
Range of:	Rural, Urban (inner city and suburban), Rural and urban
Identify sites who offer:	equipment review, group exercise and/or education
Any interesting free text on:	Data, Challenges with remote delivery, Successful delivery
As far as possible	All countries and counties in the country.

APPENDIX 4.2: REMOTE SERVICE INTERVIEW SCHEDULE

Thank you for agreeing to take part in an interview about delivering remote physiotherapy in your service, you can ask to move on from any questions or end the interview at any time. All interviews will be recorded but you will be given an ID to maintain your anonymity and you will not be identified in any reports or documentation unless you give us specific consent.

NB. Please note specific prompts will be added per site based on their survey data and any data/documentation provided prior to interview.

1. Can you briefly tell me about your overall role? –grade, -experience
2. Can you tell me about your service prior to COVID19 pandemic?
3. Can you tell me about your remote service?
   Prompts:
   a. When did you set it up and was it in response to COVID19 (when did you start preparing to deliver in this way)?
   b. If you involved patients in setting up your service can you tell us more about this?
   c. Can you tell me a bit more about what aspects of PT your remote service covers (example- triage, assessment, exercise delivery, case discussion with MDT etc? (notes from survey on what they have said they deliver used as prompts)
      Are approaches to case discussion with MDT any different to pre-COVID?
      Which patient groups is it for?
   d. Was the setup of your service a service response or a request from management?
   e. Has your patient criteria had to change? What were your criteria for physiotherapy during the pandemic? If further classified into F2F or remote, how did you decide on that

f. Which staff deliver it (experience, grade, students, support workers, therapy assistants, admin support)?

g. What technologies do you use and why (have they changed over time)- Again refer to survey

h. What happens to the patients who cannot/ do not want to use remote PT?

4. Have you and/or your staff been provided with training to deliver a remote service (including technical skills, communication skills, help patients with technology and ability to deal with difficult situations)?
   a. Have you been 'shown' how to use the technology? (some people only see something formal as training)
   b. Is there any other training that would be useful?

5. Have you or your staff been provided with equipment/software/room to deliver a remote service?

6. What were your first impressions of delivering physiotherapy remotely?

   a. Have these changed as time went on/ the service became established? What has led to these changes? How have these changes reflected across various patient groups and components of physiotherapy?

   b. Are you intending to keep delivering your service/or aspects of your service remotely? Why or why not? Are there some aspects of physiotherapy you will continue to deliver remotely and some you will not?

7. What were your staff members/colleagues reaction to delivering remotely?
Link to whether they have data on staff satisfaction

   a. Have there been concerns around loss of skill, has their initial reaction changed, was this initial reaction a barrier? If their opinion has changed, what has facilitated that (either positively or negatively), is that training, equipment, procedural, self-confidence, etc. Are staff persisting with remote delivery?

b. Are you having to provide staff members with additional support?

c. Are staff providing remote services from their own homes?

d. How do staff feel about remote continuing as an established part of service delivery in the future? (if this is the case)

8. How have patients responded to remote delivery?

    a. What kinds of reactions are you seeing? Any feedback on whether patients would choose remote over F2F if they had the choice?

    b. Did patients need family members/carers there to support them accessing the remote rehab and if this differs in terms of gender, age, comorbidities etc?

    c. If you involved patients in evaluating services, could you please elaborate how you went about it?

    d. What has the take-up been amongst patients? Are there any differences in take-up dependent on area people live, demographics, social-economic status, age, ethnicity, health conditions? Health inequalities? Who have you found remote PT most suitable for? Who is it not suitable for? How do you monitor the level of take-up among patients and ensure equity of access (refer to evaluation data).
    What can you tell us about cohort don't access remote PT.

    e. Are patients persisting with remote delivery?

    f. Are you getting an increase or decrease of DNA? What percentage of patients are Unable to Attend and How many Do Not Attend?Are there differences in characteristics between the two cohorts?

9. How are you using patient feedback/evaluation? Do you see a change in patient numbers compared to face-to-face and do you have any waiting lists? Please elaborate.

10. Are you or family members/carers having to provide additional support? What support needs to be provided? Has this support changes as lockdown has been lifted and then re-introduced? Is the amount of support provided different dependent on gender, ethnicity, age?

11. Has remote delivery affected clinical capacity and the number of patients you can see? Are you seeing any change in the number of patients who re-present to your service after remote physiotherapy compared with face-to-face service?

12. What kinds of outcomes are you seeing for patients who attend your remote service? Are you able to use your routine outcome measures? How does this impact on your service (if at all)? How do you evaluate the outcomes and how do they compare to face to face?

13. Have you had any patient incidents? (e.g. technical issues, falls, injuries, patient safety, confidentiality issues, safeguarding). What have you done to prevent recurrence?

14. Can you talk to us about the disadvantages, challenges and barriers to delivering a remote service? Are there any profession and specialism-specific challenges? How could they be overcome?

15. Can you talk about the advantages or benefits you think there are/have been to delivering a remote service? What would be your top tips for a service which was just setting up remote delivery?

16. Is there anything that in retrospect would have really helped you in setting up your remote service?

17. Who makes the decisions about the way your remote service is delivered and what influence on these decisions do physiotherapists within the team have?

18. Do you have any other feedback regarding the delivery of remote physiotherapy?

APPENDIX 4.3 CASE STUDIES

Case study 1: MSK (including First Contact Practitioner, Woman's health, Pain). What the service looked like before COVID

This service based in a large trust included a Musculoskeletal (MSK) Physiotherapy Service, Integrated Musculoskeletal Service, and Integrated Pain Service and, during the pandemic a First Contact Practitioner service was implemented. All are based in the out-patients department of the hospital or GP practices, taking referrals from consultants and GPs. The Integrated MSK service offers full clinical assessment, which may include referral for diagnostic investigations such as MRI or ultrasound scans. From which they may be referred onto a surgeon if indicated. The integrated pain service is multi-disciplinary and aims to help patients manage their pain independently. The service ran two group-based pain management programmes.

What happened when COVID 19 pandemic hit in March 2021.

The MSK Physiotherapy Service started to deliver remotely for individual consultations; groups were only possible latterly (because of 'governance issues' and difficulty identifying a suitable platform). The team have established a range of video conferencing competencies for delivering remote physiotherapy. The Integrated Pain Service were redeployed and the service closed March-May 2020 but then service reopened to patients who had already started treatment. They now hold groups to nine patients per group over Microsoft Teams. As an alternative an online, self-directed pain management course was put together and added to the service website. Patients were encouraged to complete the course over 6 weeks, and followed up by a clinician. The team use the same outcome measures before the pandemic.

Methods

Uptake and adherence - Data are reported on Did Not Attends (DNA) and age category of those who accessed remote and in-person physiotherapy.

Patient perspectives/ experiences – patients were surveyed about their views of remote physiotherapy appointments (when booking the appointment) and of their satisfaction/ experience of treatment during the summer/autumn of 2020.

Staff satisfaction/experience - A summary was provided on staff reflections around choices between video conferencing and telephone appointments and 'lessons learned' from the first wave of the COVID pandemic, and training needs. Twenty-one staff members completed a survey in July 2020.

Interview

A semi-structured video-conferencing interview was carried out using Microsoft Teams. The physiotherapist was seconded to a FCP role but was normally band 7 team lead for the Musculoskeletal Physiotherapy Service. The perspective mostly comes from those services, although we do include themes across other services.

Results

Musculoskeletal Physiotherapy Service

Uptake, adherence and drop-out

209 patients were sent a text following no response from the letter invitation, 30 patients (14%) booked an appointment (after text), six patients (3%) replied to say they did not want physiotherapy remotely, 149 (71%) patients did not respond.

DNAs for new patients were high (45.3%) in April 2020 due to lockdown but this averaged out to 6.7% between May and December 2020. DNAs for follow-up appointments were higher in March (14%) and April (16%) but dropped to 1.7% in May and averaged 12.2% between June and December 2020. This was, overall, lower than 2019. They also noted that referrals into the service dropped after lockdown to less than half the referral rate for 2019 in Summer 2020 but rose back to 70-80% of usual referrals in August-December 2020.

Patient characteristics and delivery method (digital exclusion)

For initial consultations videoconferencing was most common (52%) with telephone consultations more common for subsequent appointments. Older patients tended to prefer telephone appointments over videoconferencing. Those aged between 70 and 79 received telephone appointments (55%) over videoconferencing (31%), with even fewer patients over 80 receiving appointments through videoconferencing (17.5%). There are similar figures for follow-up appointments with only 13% of those aged over 80 receiving their

consultation through videoconferencing.

Table A4.311: Delivery method by appointment type

Attendance mode	**Initial appointments (n = 4,123)**	**Follow up appointments (n= 9,421)**
In-person	560 (13.6%)	1475 (15.7%)
Telephone	1413 (34.3%)	4643 (49.3%)
Videoconferencing	2147(52.0%)	3298 (35.0%)

Patient perspectives/satisfaction

July 2020

51/122 (40%) of patients responded: 30 women and 21 men with a mean age of 52yrs (range 0-81).

Table A4.312: Patient satisfaction

	Response (number of times it occurred)
Telephone Consultation	Ok/no concerns (22) Prefer in person (8) Apprehensive about how it will work (8) New normal with Covid19 (5) Limited achievement by phone (5) As long as it meets my requirements (4) Video would be better (3) Improve safety with decreased attendance at hospital (3) Deafness is a limitation (1)
Video Consultations	Ok/no concerns (14) Unsure if can get correct diagnosis (8) Prefer in person (7) Safer with Covid19 (7) Can be shown exercises better than phone (7) No access to video/tech (5) Apprehensive (4) Reduce travel and parking (3) Don't like to be seen on video (2) Better for the future (1) No different to in person (1) Previous video appointment so ok–apprehensive before (1)

About half had no concerns with a telephone consultation, with some considering this 'the new normal' to maintain safety with Covid19. However some patients were apprehensive about how it would work and less effective than in-person care. This did not appear to be

related to the type or duration of their conditions.

Most comments about video consultations mirror those for telephone contact. However, some patients did not have access to videoconferencing technology, which made it unsuitable. Some patients felt video allowed the physiotherapist to see them and treat them more effectively than telephone and one patient suggested it is not different to in-person care. Advantages to video consultations were reduced travel time and parking with one patient describing this as '*better option for future service provision*'. Others questioned whether they would get a 'proper' diagnosis via video and would prefer in-person consultations.

October 2020 report

211 patients responded aged 18-75+ years; 140 (66.3%) women and 194 (92%) were White British. Most were seen by videoconferencing (111, 54%, vs 93, 46% by telephone). 145/163 (89%) rated their satisfaction as 7+/10 with 87 (53%) completely satisfied. 43/54 (79%) who answered rated their confidence in managing their symptoms as 7+/10. 45 (of 55 who answered, 82%) were likely or extremely likely to recommend the service to family or friends. 19/209 (9%) preferred a virtual assessment with 117 (56%) preferring an in-person appointment; (35%) had no preference. These findings were illustrated in written comments. For example:

"*Worked well, saved time rather than go to hospital for a 15min appointment*", "*The video link wasn't the best. Kept freezing up*".

"*Unfortunately for this type of therapy it just doesn't work. Examination is needed*".

"*In this instance the telephone consult was ideal for a follow up if f2f could be offered if needed*".

The findings represented for the Musculoskeletal Physiotherapy Service are replicated in the data for the Integrated MSK service and the Integrated Pain Service (although the percentage of older adults accessing videoconferencing was lower) for the Integrated Pain Service.

Staff experience (Integrated Pain Service)

Telephone consultations were provided more frequently than video conferencing, in response to patients' preference. Other reasons to choose telephone consultations included:

1. Physical assessment was unnecessary

   Patient had often been through assessment recently or conditions such a fibromyalgia require little physical assessment and could be confirmed via video anyway.
2. Physical treatment was unnecessary (e.g. education and coaching)
3. Telephone can facilitate better patient-provider relations

   Many patients have psychological triggers/complex reasons for their pain presentation. Some patients opened up more and were more candid about their experience over the phone. Lack of visual contact helped to eliminate bias and assumption from both parties.
4. Less preparation was need by patients to attend telephone appointments

   Patients often find activities of daily living challenging so may prefer telephone appointments as it means they did not have to get themselves ready in the same way.

Staff learning (all services)

Staff had challenges with the remote booking system adopted by the trust and lack of technology and connectivity;

"great opportunity and working well but WiFi at xxxx is poor, lose connection then can't get back on so have to finish assessment by telephone".

They missed the social aspects of in-person working and found working at home isolating and challenging, particularly when working with patients for whom English was not their first language and they felt they needed more support and training in this area;

"*I would benefit from info on setting up 3 way call with interpreter".*

However, they did acknowledge virtual physiotherapy offered some opportunities such as re-thinking their service, time to develop resources and positive patient feedback. Their skill using AccuRx developed over time. Initially AccuRx worked well but then as more staff were using the system (returning from redeployment) its performance declined.

Table A4.313: staff experience and satisfaction

Technology	Challenges with setting up different templates for clinics and having to manage future booking effectively. Poor connectivity issues Lack of Tech to function effectively
Positive	Opportunities to rethink service / digital innovation

	Increased physio tool log ins – working more efficiently Opportunities to work cross site projects Working with clinical audit team for service improvement Good prep for Video Conferencing and online resources Positive patient feedback Opportunity to access Therapy Live Opportunity to develop virtual groups Home working opportunities
Negative	Difficulty having regular breaks Miss lunchtime camaraderie Isolated working in clinic rooms No time for team to be together Wouldn't want VC working like this to be the normal Home working can be isolating

Interpreter incidents

Several incidents were reported when attempts to integrate interpreters into remote consultations had been unsuccessful. The main problem was that interpreters were working from home and it often took a while for them to join the call, leaving less time for the appointment.

Interview summary

The Response to COVID

Catalyst for change

When the first lockdown was brought in (March 2020), half the MSK team were redeployed. For the reminder, their first priority was to continue to provide a service. Initially this was by telephone; *"There was five or six of us, I think and it was really important to us not to just discharge patients".* As staff returned to the department from their redeployment, there was insufficient room for them to maintain social distancing so they had to embrace working from home, which was new to them. *"People had to trial home working. Some staff had barriers to actually wanting to do home working from a social perspective".*

FCP was set up to be delivered remotely even when it was delivered from within the GP practice. They would have preferred to do some first contacts through in-person delivery but initially this was not an option initially; ***"****So I think we would have preferred to have set up an FCP service with some element of face-to-face but we had to set up with what the situation was at the time."* The FCP did discover that GP's were under the assumption that all of the physiotherapy delivered was only online during the covid period; *"so I'm having*

to myth bust within the GPs to say at the moment, you know, your first appointment is virtual and if you come to an agreement between yourselves that you need to go in, you can go in for face-to-face, assuming you meet risk assessment."

Effective leadership

The staff leaders had to make improvements rapidly to keep the service running and were proactive to support staff development and implement changes and further improvements with a 'can-do' approach to enable the service to continue whatever the situation, which was met with surprise by other departments. *"I think we were just very proactive in responding to our patients' needs and had the right timing to be able to get what we wanted."*

They felt the team responded in a similarly positive way by pulling together as a team, setting up and learning how to use remote technology, being proactive and supporting each other.

Development of remote physiotherapy

Organisational support/ Barriers

Setting up and training to learn how to use the remote technology was all developed within the team and not provided by the wider organisation at the start of the pandemic; *"the training that we did was literally between ourselves and doing AccuRx with our family at home to see does it work, how did you do it"*. The team leaders were keen to ensure the service met patients' needs and obtained support from the clinical audit to assess this.

The managers encouraged staff to work flexibly at home which supported the service infrastructure (lack of office space) and the social aspect of staff interaction. However, the trust was slow to authorise service changes, for example being able to use the TEAMS platform to communicate with patients which was frustrating and hindered service delivery.

Plan plan plan

The team worked together to become familiar with the online platforms before seeing their patients remotely and this included creating **a pack of resources** for delivering*:*

"We had to do little inductions -this is AccuRx, this is that, this is where your resources are."

"we did a whole training session one morning on how do you assess a joint virtually, how do you do this…what's your experiences of this? Little workshops on how to use Teams, how to do interpreter"

This included dealing with concerns about (COVID), headphones were an essential aspect of remote consultation due to the noise consideration, and sharing of equipment was not possible due to infection control measures. A delay in receiving headphones meant "*So in all honesty, now we just use our own."*

Delivery of remote physiotherapy

Practice Practice Practice

Staff dedicated time to share skills and best practice in staff training and to practice using videos for consultations and assessment to enable the remote service to run smoothly. A **leaflet to support patients** to set up their technology at home was produced:

"an NHS video consultation leaflet that we just put our header on …when the [appointment] letters went out, they had the instructions on how to do it" and their administrators helped patients with set up "They've [the administrators] talked them through it, so they've had that work-up. …To have that really good prep makes it as successful as it could be."

The team learnt to probe presenting symptoms thoroughly when working remotely (as they could not rely on physical assessment) to ensure the patient followed the most appropriate care pathway. An unanticipated benefit of working virtually was that patients often found it easier to discuss more **personal issues** remotely, perhaps as it was easier without direct eye contact; "*Actually virtually, we then probed with questions better."*

Troubleshooting and learning from unanticipated challenges became an important part of the service. The team experienced unexpected events or situations with patients in their homes when they had made contact, so they provided more information to prepare patients and manage expectations to ensure they were ready for their therapy session, support safeguarding and maintain confidentiality. *"There have been some issues on virtual, where*

people have suddenly just undressed!" After another **incident** (in which the patient had gone to another location and were at risk)**,** they started to ask patients where they were and to ensure they were in a safe environment (and they could call emergency services if needed) at the start of the call.

What is remote physiotherapy good for?

The service discovered that remote delivery can be helpful to all patients but some may need a blended for the best outcomes; "*It might start off either way [remote or in-person] and then progress the other way."*

Remote delivery was particularly helpful for most **follow-up appointments such** as delivering results, as it reduced patients' travel.

They also found the virtual groups very successful and patients have appreciated **social connection** with others albeit remotely; *"[The patients] are actually really enjoying the socialisation that the video aspect brings… really like seeing people on the screen each week".*

The FCP gave good examples of where they had managed to support patients remotely: *"nerve root problems ongoing worsening, but then didn't feel the need to bring them face-to-face because of what we could do virtually meant we could see it and then refer on".*

What is remote physiotherapy not so good for?

Prescribing and fitting **mobility aids** virtually was challenging but a process was developed for low risk groups: "*They've said their height … and we've sized up the crutches. We had to leave them at the main entrance all wiped and cleaned with their name on…"*

S**ignposting patients to other services was a challenge** because so many community based services were shut. The team found that some patients and some conditions needed to be seen in-person so as direct **communication and touch** were needed**.**

> *"Some need that face-to-face and you need that touch… You can describe something and send them an exercise sheet. But even then, when you've seen them face-to-face in the department, they can come back and be doing exercises wrong."*

Sometimes patients needed to be seen in-person if they were not making the progress expected when seen remotely:

> *"If you think someone's struggling that should be your big key indicator that they need to be seen."*
>
> *"You can see it a bit on a video. Some of the video assessments, you know, you can't quite tell if it's a capsulitis or an impingement of the shoulder which may change management because you can't get hold of it and stress it"*
>
> *"Sometimes you need to just have a look … Why's that knee not bending so much?*
>
> "*With women's health issues a physical assessment is important in terms of assessing".*

In contrast, some patients are more willing to access the service remotely because it is easier and less embarrassing than in-person interaction, resulting in better attendance rates: *"Women's health was always quite a [non-attendance] which virtual has really helped."*

Sometimes patients needed to attend in-person to build confidence and manage anxiety.

> *"You've got some anxious back pain patients …usually you might get them exercising on a bike while you're chatting to them"*
>
> *"She needed to come in face-to-face for that interpersonal "let me look at your joint, let me see it, let's see how you move, let's check your exercises". Because it's a different relationship, that trust that you can get with some patients, especially your anxious ones…"*

In contrast, there were patients with **anxiety/agoraphobia** for whom remote delivery had worked very well: *"Two people who have been through the group who don't like coming in face-to-face and one is agoraphobic…There's been some barriers dropped by being able to access it virtually."* From a team perspective, remote delivery was challenging in terms of sharing **practice***: "that team chat has got less… you're maybe not identifying in the same way those safeguarding things."*

<u>Who does remote physiotherapy work for?</u>

An important element of deciding who was/was not suitable for remote physiotherapy was to consider each patient individually. For example age was no barrier *"We can't… say old people can't use technology because it's had really good outcomes."* But patients needed to have to access the technology and be able to use it, which excluded some patients who were already disadvantaged. .

The team reported that remote consultations were a lifeline for those who were shielding, and was feasible, especially if they had assistance from others if their disabilities required it.

Remote physiotherapy was particularly challenging with patients for whom **English is not their first language,** not least because there was a need to involve a third party (the interpreters) in the call, which was often problematic; *"you promise someone that they're going to have an interpreter coming online and then they don't arrive".*

Technological barriers

Access to **devices** for patients and **connectivity** during the consultation were an issue for both patients and staff. In such cases, the phone had to be used as a back-up but this was not always successful; *"you'd try and do a video consultation and something would happen …we're trying to do the best by the patients but we've had to revert to the phone".* Furthermore patients were often unfamiliar with video conferencing platforms (such as zoom) but they felt secure because they were using an app with NHS approval.

Change over time

Acceptability.

Initially, some patients were not receptive to the idea of remote consultations, considering it "ridiculous". However, after the first phase of the pandemic (June /July 2020), the service noted that uptake of remote physiotherapy was similar to that for in-person appointments. Therefore they made the decision to continue to offer blended service with remote consultations combined with in-person when appropriate.

Overall, although remote consultations had value, patients' preferences needed to be considered:*"70% will probably prefer some form of face-to-face. Probably 20-odd per cent are definite face-to-face, but some maybe not be bothered."* This needed to be balanced with their organisation's expectations:

> *"I know our trust are kind of trying for 60% outpatient appointments virtual, 40 face-to-face…But we don't think that's right for physio because of that touch perspective, that interpersonal perspective, that rehab perspective. We probably think about 70/30 is about right in terms of 30% virtual, 70 face-to-face."*

A further consideration was the impact of working remotely on staff satisfaction: *"This [remote working] isn't what we signed up for… if one [day per week] was fully virtual and the other four were face-to-face, that's fine…but even 50/50 I think people would be like, "really?"*

Time.

Initially delivering physiotherapy remotely took longer than in-person care and appointment times were extended. However as skill and confidence grew, timings reverted to the pre-COVID structure; "*So whereas you used to have 50 minutes for a first new patient, it was an hour, follow-ups were half an hour. Now we're going back to 50 minutes".*

Adherence/DNA

Attendance rates have been discussed in detail above, but the interviewee reflected how changes in lockdown restrictions, with non-attendance increasing when restrictions were lifted, because "*people were going back to work… and did not prioritise an appointment".*

In the future, the interviewee believed attendance rates could be improved further by using a blended approach. *"If someone can't attend their face-to-face appointment in the future you could say "Would you prefer a virtual one instead?."*

Top tips

Ensure you establish:
• How to carry out objective assessment on AccuRx - Outcome measures/objective testing/neuro/home environment.
• Safety netting - Escalation/pathways/referrals/Knowledge and understanding of risk
• Motivational interviewing – Upskilling-handling non-verbal cues
• Signposting/Community referrals
• COVID knowledge and long term management.
• Policies- DNA/prep/privacy/treatment/COVID screening
• Technology –
  o Connectivity
  o An induction pack
  o How to work with Interpreters
  o Use of Webcams/ipads/phones
• Flag any incidents (technology/interpreters) early on rather than waiting for issues to build up.

Conclusions

This is a complex case study covering several forms of MSK physiotherapy. This service worked together as a team to develop resources and plan their remote service. They were one of the few services who asked patients at the very start whether they would be able to engage with video conferencing. They were driven by proactive leadership in terms of accessing equipment, technology and other resources, and planning training which supported more effective delivery. They recieved some organisational support to evaluate their remote service which is reflected in the detailed data shared but had difficulty collecting patient related outcome measures. They received mixed feedback from patients and staff, greater flexibility and saving travel time and costs were key benefits but this needed to be balanced by technical difficulties such as poor connectivity. Overall, this service plans to continue remote delivery as part of a blended service.

Case study 2: MSK (GP practice based and acute hospital)

What the service looked like before COVID

This service was based in a hospital physiotherapy outpatients department and GP practices, In the GP practices patients were often referred via the First Contact Physiotherapist based in the practice. The caseload was mainly MSK with a focus on acute and chronic pain management and post-operative patients. Before the COVID-19 pandemic, all patients were seen in-person. More straight-forward cases were seen in GP practices, while post-operative patients and those requiring specialist interventions (such as use of the gym) were referred to hospital outpatients department.

What happened when COVID 19 pandemic hit in March 2021.

The GP practice based service changed to telephone or videoconferencing but each practice had different policies and procedures to mitigate the risk of COVID-19 transmission. Some accepted that some patients needed to be seen in-person, but at least one practice closed the physiotherapy clinic and insisted that that all patients were referred to the hospital outpatient department.

All patients' needs were triaged to assess whether they required an in-person appointment, or could be managed remotely. Patients who were considered to need in-person care were seen in out-patients department. Triage was based on needing an interpreter, the nature of their condition, the treatment they required and patient preference.

AccuRx and AttendAnywhere were used for remote video calls. It enabled individual consultations but did not have capacity to offer group sessions. Appointments were arranged by the physiotherapists or administrative staff. Patient reported outcome measures replaced objective measures. Referrals from GPs declined during the pandemic, possibly because they knew that consultations were virtual and thus not suitable for everyone. *"They [GPs] are just not sending referrals like before because of the telephone appointments".*

Methods

Interview

A semi-structured video-conferencing interview was carried out using Microsoft Teams with a physiotherapist working across both services.

Interview Summary

The Response to COVID19

COVID19 a Catalyst for Change

The physiotherapist felt uncertain about how physiotherapy could be delivered virtually as they only had experience of working with patients in-person previously; "*I more wondered like, okay, what I'm going to do this video. Because even I was literally thinking how it's going to work"*

Professional identity

This Physiotherapist was concerned about losing some of their fundamental physiotherapy skills particularly hands-on techniques; *"We have all the knowledge and the skills, but if you are not practicing that for a while, then you might be having a gap in that area."* They also had concerns about whether virtual physiotherapy would be as effective as in-person physiotherapy.

Development of remote physiotherapy

Two different applications were tried. AccuRx was preferred initially as it was a simple link for patients to use. Later AttendAnywhere was tried, which allowed reception staff to send out an appointment and all patients were sent to the same 'waiting room'. This was less flexible so as the service developed, the physiotherapists made their own appointments using AttendAnywhere

Plan, plan, plan

Deciding whether to treat a patient in-person or remotely was a complex process based on individual risk assessment. Good history taking was considered key to support the screening process. Careful questioning about symptoms, any red flags (for patients with back or neck pain), social situation, whether safety concerns (assistance at home and any history of falls)*;"if there is any red flag symptoms, we can clearly ask questions."* The patients social situation was also risk assessed and patients were routinely asked for about the support they had at home or whether they had fallen; *"During the initial assessment, I always check how their lifestyle, whether they are living alone or is there anybody to help".* Other factors included the physiotherapist's clinical experience, the patient's conditions (such as the severity to speed of any changes in symptoms) and the treatment they required, and the

patient's environment. Patients were not always where they were expected at the time of the call, which meant that calling them on the phone, or video became unsafe. One example was when the physiotherapist contacted a patient for their arranged session, to discover the patient was driving their lorry in Europe at the time! Consequently, a policy was introduced to always check that the patient was in a safe place to start the consultation.

In general, the interviewee felt 40%-60% of patients could be seen remotely. If a patient required hands-on treatment (manipulation, for example) or to use gym equipment as part of their treatment then in-person delivery was advised. A few, patients preferred video appointments *"2-5% are preferring video appointments…like the pregnant ladies [because of the risk of catching covid if attending hospital]."*

Implementing remote physiotherapy

What is remote physiotherapy good/not good for?

The interviewee observed that delivering physiotherapy remotely, tended to encourage the patients to take greater ownership of their condition and the physiotherapists' role changed to encouraging **self-management** rather than a reliance on physiotherapist–led in-person treatment.

> *"One of the big advantage which I noticed…. People are realising "I can do it in the home, so I don't need to come, perfect, you can discharge me" ….We can do the … good advice and the patient-related education and exercise."*

The interviewee found they could provide the same exercise prescription remotely as they would in-person where for patients with ''straight-forward' problems. However there were some challenges identified. Assessment was difficult to complete thoroughly when working remotely as a full and accurate view of the patient was not always feasible via video. They found hands-on in-person assessment more accurate and comprehensive. For example when **assessing range of motion,** one may be limited to the patients' report of what they can do, rather than being able to observe;

> "*I can't really get information how far she's able to lift. She can say "at the shoulder level or below the shoulder level…movements through the video give some information, but the palpation and the joint movements, when you are checking through your hands-on [are needed to] get like clear information."*

Measuring outcomes objectively was difficult via video and the service moved to more patient reported outcomes instead, for example counting the number of exercise repetitions the patient could complete rather than measuring strength.

Older people and those without the technology or WIFI connection for video conferencing often preferred telephone calls. Telephone appointments also often easier to fit into patients' schedule. Video calls were not always convenient or appropriate as patients were sometimes in inappropriate places to complete a video call which limited the treatment that could be done. Preparation was needed to manage patients' expectation and make boundaries clear; *"Sometimes in the early morning appointments, the patient says, okay, I am in bed, so I can't do any face-to-face."*

The **group sessions** provided in this physiotherapist's out-patients department were suspended due to COVID19, they were not able to be offered virtually and were missed by patients. *"we are missing, the group sessions… encourage them and get more motivation in that perspective."*

Who is remote physiotherapy good/not good for?

A benefit of seeing straight-forward cases remotely was it was time –saving which meant more time could be offered to those with more complex needs or who had 'red flags'.
Any patients who may have 'red flags' (signs of possible serious spinal cord pathology) were considered to need in-person assessment. "If there *is a real red flag like…sensory loss or incontinence issues, we can just go a little bit [with questioning] …how long? or it's progressively getting worse? So based on this, we decide whether they need a face-to-face."*
Remote physiotherapy was not good for people who did not speak good English, especially those who needed an interpreter "*Because even if I plan for the next telephone appointment, then it's going to be more tricky, like the timing and the interpreter, like the husband has to be there on the day, so many issues."*

Technological challenges

Two different applications were tried for completing the virtual consultations. The initial application (AccuRx) was preferred at first as it was a simple link for the patient to click on. The 2nd application was used by reception staff to send out an appointment and all patients

were sent to the same waiting room, which was less flexible; "*I prefer AccuRx…Attend Anywhere comes on the second step because it's slightly complicated."*

Change over time

Patients were **accepting** of the need for appointments to be carried out virtually by phone or video conferencing; *"The first lockdown…the patient's quite happy, like nearly half of my patients were happy to do a telephone or video appointment."* As time when on, the GP practice became more flexible about patients being seen in-person in the practices, when the patients' needs or preferences warranted it. The service adopted a blended model of delivery combining in-person and remote delivery. If the patient was not improving following the remote consultations, then an in-person appointment was offered to more clearly assess the situation, "*I need a face-to-face, we can just bring them in. Some people say, no, I need telephone, we can do that one. So based on the feedback, we keep changing based on the preferences the appointments."*

Top tips
• Ring the landline before the mobile number (better reception and sometimes patients do not know where their mobile is). • Let the phone ring out fully and then try it for a second time. • When talking to patients, watch the camera and not the screen because when you're watching the screen, it looks like your looking somewhere else. • Make sure you have buffer time between appointments • Use a blended approach to use time effectively and to deliver the best care.

Overall conclusions

This case study describes the implementation of virtual physiotherapy in MSK outpatients and GP surgeries. Initially any patients who needed in-person appointments (~40%) were seen in the hospital but with time, easing of lockdown restrictions and greater skill and familiarity with working remotely a blended approach was adopted. Although the promotion of patients' self-management was a benefit of working remotely, difficulty completing assessment by video or telephone was a limitation. Exercise prescription was considered equally effective in -person or by video. Going forwards the service expects to deliver more in-person treatment and assessment but will offer a blended service where appropriate and requested by the patient.

Case study 3: Community rehabilitation

What the service looked before COVID?

The community rehabilitation service provided physiotherapy and occupational therapy with support from therapy assistants. Their caseload included people who were housebound due to a neurological, respiratory, or musculo-skeletal condition, reduced mobility, frequent falls or anyone else who could not access traditional clinics. The service provided goal-led rehabilitation but not maintenance support.

What happened when the COVID 19 pandemic hit in March 2020?

As the pandemic hit, the lead physiotherapist retired, and another therapist went on maternity leave. This left only interviewee and their assistant support team. The sudden reduction in physiotherapy workforce led to a focus on thorough triage and signposting to other services/support. The service's trust advised use of AttendAnywhere for their virtual assessments and reviews. They also used the telephone.

Methods

The therapy assistants completed telephone screening for all patients discharged from hospital with a positive COVID test. They completed a questionnaire about this program. The remaining physiotherapist was interviewed.

Results

Staff feedback

Benefits of the telephone screening	Supporting patients who felt isolated and just wanted to speak to somebody. Making a difference to people who would otherwise have been missed in the system.
Challenges of telephone screening?	Time consuming. Some patients found it difficult to manage such a long assessment over the telephone. Difficulties finding access to a phone and quiet space to complete the screening Some people hard to contact at work

Interview

Response to COVID

The service had to adapt quickly from mainly 'hands-on' in-person delivery to working

remotely. It highlighted the importance of being in someone's home for comprehensive assessment. They felt remote delivery challenged the very essence of what they do, their **professional identity** as community rehabilitation physiotherapists because they felt they could not do their job properly.

Delivering Remote Physiotherapy

O**rganisational** infrastructure was limited, and although they had IT support it was not very accessible. Although they already have access to devices to deliver remote care, they had to teach themselves how to use the new technology. Decisions about whether to deliver care remotely or in-person were based on individual patients' needs and preferences. They often used telephone calls and written information to support patients.

What is remote PT good/not good for?

The team found that holding meetings remotely have saved time and effort for staff**,** *"I think it's improved the uptake of meetings, because of the ease of being able to just to dial in, and attend that way".*

They also found that working remotely tended to promote patient independence and **self-management** as professionals could not control the situation to the same extent. *"I think patients are starting to understand the benefits of doing a bit more themselves, and having that motivation, rather than it being us".*

Who does remote physiotherapy suit/not suit?

Many of the community rehabilitation service's clientele struggled with video consultations so the telephone became the main platform for remote care. This limited the scope of visual observation of patients'' environment and their ability to function in it, which was a key part of the assessment process. *"What we see on NHS Anywhere or on a telephone, is quite a small little [part] of what we would normally see during our home visits".*

Those who did not have **English as their first language and** those with **hearing** and **cognitive** impairments struggled with access remote physiotherapy. The therapists would assess the risk and visit those who might become confused or distressed in-person; "*those where English wasn't their first language, again, being over a virtual platform and things, it was quite hard for them."*.

Technological barriers

C**onfidence using technology** was mixed and the NHS Anywhere platform was considered unreliable, such that many patients avoided further video calls after the first appointment. Patients tended to prefer platforms with which they were familiar with many requesting **to use** Zoom, Teams, Facebook messenger and WhatsApp. However, the service's organisation did not allow this.

Change over time

Over time, both staff, patients and families became more familiar, comfortable and skilled using remote consultations; *"Families and carers have been a bit more proactive about accessing those things, and getting them set up…in the second lockdown, compared to the first".* The team quickly realized that most **patients preferred either a telephone conversation** or to be seen in-person in their home and eventually stopped offering video calls altogether.

Top Tips
• Put the patient at the centre of decision-making • Assess each patient on a case-by-case basis respecting their needs and wishes. • Allow plenty of extra time to repeat instructions for greatest clarity. • Use first assessment telephone call for subjective screening, assessments and goal setting allows you to concentrate on the hands-on objective needs of the patient during the in-person visit. • Save time by completing follow-up visits via telephone.

Conclusion

Overall, this service found video conferencing unsuitable for their clients because of the severity of their disabilities, lack of connectivity and access to devices and unreliability of the platform. Neither video conferencing nor the telephone clearly show the patient's home environment which limited assessment compared to in-person home visits. They did however find video conferencing useful for MDT meetings and felt that this was something they would retain. In the future they intend more frequently use the telephone for initial consultations and follow-up appointments.

Case study 4: Community Neurological service

What the service looked like before COVID

The team's clientele were patients their area with a neurological diagnosis. They provide home visits and ran community clinics three times per week for ongoing treatment while patients were progressing towards their goals. Once patients met their goals or were unable to progress they were discharged. There was a substantial waiting list for their service.

None of the team had used remote methods of physiotherapy.

What happened when the COVID 19 pandemic hit in March 2020?

All non-urgent in-person visits were suspended (patients considered urgent eg those at risk for (re)hospitalization were still seen in-person) and AccuRx (video conferencing) was recommended by the NHS Trust governance team. This allowed the team to continue seeing patients. The teams' waiting list were screened against the inclusion/exclusion criteria listed (Table A4.341) based on information gathered from initial referral to the service, and a telephone to triage.

Table A4.341: Triage criteria for service

Inclusion	Exclusion
Consent gained. Neurological diagnosis requiring active physiotherapy input. Access to a smart phone, tablet or laptop/computer with a webcam. Able to safely and independently complete a home exercise programme with verbal prompts/guidance only.	Cognitive impairments limiting ability to use video software or follow instructions. Language barrier where interpreter would be required. Complex communicative needs e.g. aphasia, deafness. Severe visual deficits. Rehabilitation needs that would require in-person input of >1 therapist such as those patients requiring complex transfers or at high falls risk.

Patients who met criteria were then contacted by telephone to using discuss AccuRx video calls rather than in-person consultation. AccuRx software and technology requirements were explained to ensure informed consent and that the necessary technology was available.

Methods

Data

The remote service was audited April –July 2020. Data on uptake and adherence, patient and staff experience and resource use from the audit are presented here.

Interview

A semi-structured videoconferencing interview was carried out with a team member who led the remote service audit; a band 6 physiotherapist with 18 months clinical experience.

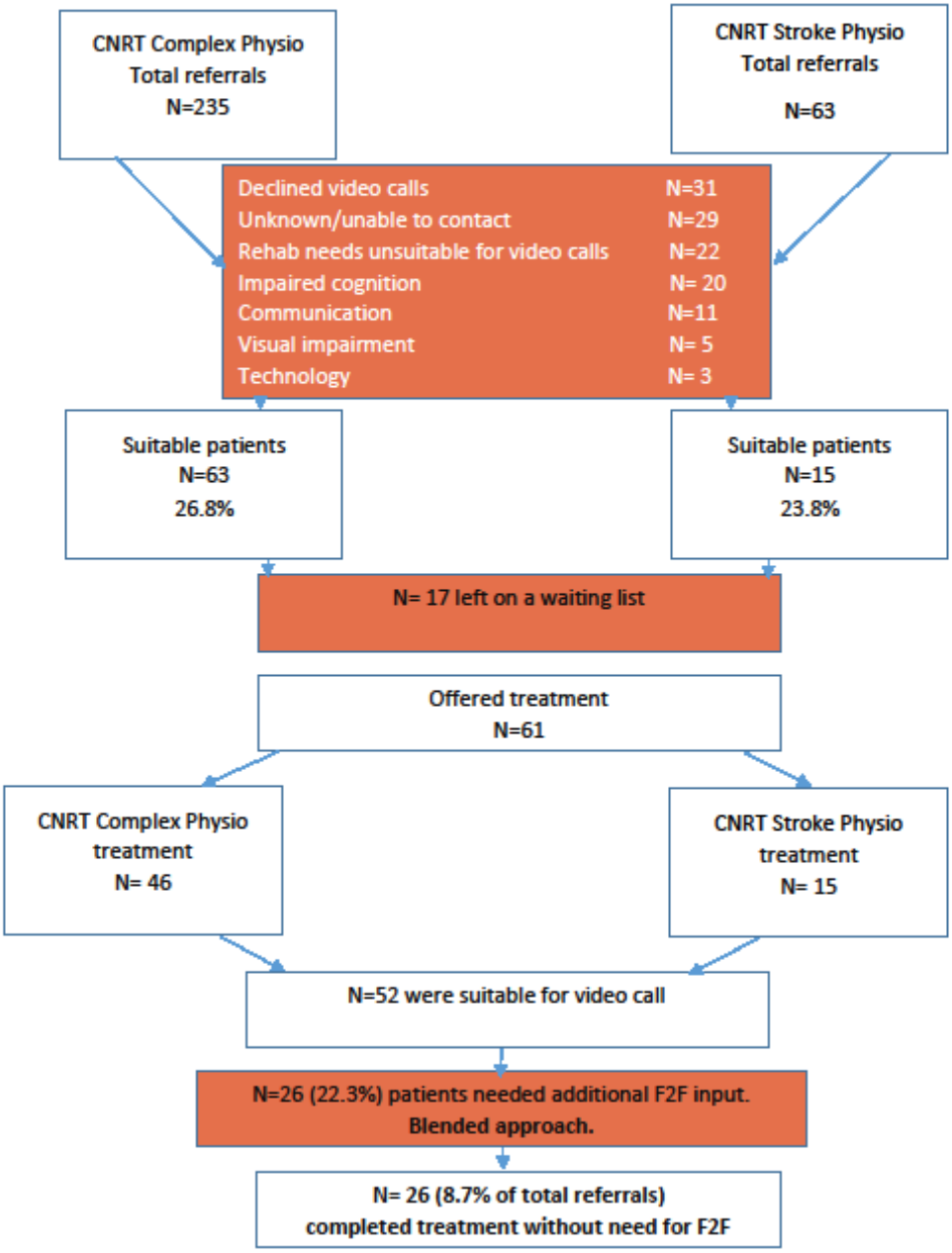
Results

Uptake and adherence

52 patients of the 298 patients (17.4%) referred to the team were suitable for video conferencing and only 26 patients receiving their treatment fully remotely, with the rest receiving a blended approach. Patients received an average of 5.8 sessions (range 1-20) depending on their goals and ability to engage with video conferencing. Most patients were women (70.6%), and white British (88.2%). Figure A4.341) illustrates patient flow through the service.

Figure A4.31 showing the flow of patients through the service

Flow diagram of patient's remote journey



Patient satisfaction

Seventeen patients responded, of which fourteen (82.4%) patients found their AccuRx consultation to be excellent or very good, although some experienced technical problems.

> *"On the whole the service has been very good. On just two occasions there were technical glitches so the appointment was taken over the phone which was fine."*

16 (94.1%) patients found it was very easy to use, while a further 11 patients (64.7%) found they needed family support; *"occasionally I had my daughter to hold the phone and it was much easier for me (for positioning)".*

All respondents felt that they had a good rapport with their physiotherapist and were able to discuss confidential issues: *"Xxx was so kind, caring, professional and helpful with his confidence, core strength and we looked forward to the sessions.*"

16 (94.1%) of patients were satisfied with the security of the conversation through AccuRx. They were aware the session would not be the same as in-person, but accepted the limitations and were pleased to receive input. *"It is hard for the limitations of video to match physical presence in physiotherapy but, given the circumstances, these sessions have been fantastic and a very valuable substitute…Long term, if this method meant the potential availability of more sessions, I would be happy to continue."*

Staff satisfaction

All staff found AccuRx easy to use, but only two of the six therapists who responded felt they could carry out a complete and thorough assessment this way *"It would be useful for sessions whereby patients are doing an exercise programme with limited/no hands on therapy."*

Only half of respondents felt patients met their goals during remote physiotherapy, and they had to be innovative and creative to complete assessment and deliver treatment. All respondents experienced technical problems with AccuRx, with half rating it as fair or poor. Some staff stopped using it but others found it "*a useful addition to how we carry out treatment sessions and would help to reduce expenses and our environmental impact. The majority of my patients have found it extremely beneficial to receive treatment this way".*

Problems with poor connections (n=5); assessment (n=3); supervising home exercise (n=3) setting patients up on AccuRx (n=2) and screen layout/visual aspects of the platform (n=1) were reported.

Resources

On average, a new assessment completed remotely took 58 minutes (range 45-90), with a follow up appointment taking of 38 minutes (range 30-45).

Interview summary

The response to COVID-19

As GPs referrals dropped, the service used COVID-19 as a **catalyst** to proactively 'pick up' patients when discharged patients from hospital. This was something they wanted to do for some time as research suggests seamless transfer between hospital and community care is beneficial for patient outcomes. It also bought them time to plan how to deliver remote care to the patients on the waiting list.

The interviewee initially feared patients would be less likely to follow their advice and recommendations when delivered remotely and were concerned that as a hands-on profession, they would lose specialist skills, "…*You do lose, I think, a little bit of that specialism maybe".* There was extensive conversation around the **inability to get hands-on**, to feel, guide and prompt when demonstrating exercises and the lack of **thorough and non-specific assessment**. Concern about 'missing something' during assessment and confidence to provide only the simplest treatment programmes remotely were also raised. "*I don't think there's anything you can do on video calls that you can't do face-to-face, but I think there's a lot of stuff that you can do face-to-face that you can't do on a video call."*

Development of remote physiotherapy

Although their trust governance team restricted the platform that could be used, the team successfully developed triage and assessment protocols for remote services with a "true **team effort"**; *"It was a discussion between me and the team lead around… how we can implement this?"* However, it was time consuming to develop and complete. Even when candidates appeared suitable for remote services, the physiotherapist had to telephone them to determine whether the patient met the referral criteria; had access to the necessary technology; were able to use the technology and exercise remotely and agreed to a video appointment.

They realised **standardised outcome measures** needed to be adapted for remote assessment, and a desperate need for **supplementary online resources** (links and websites) to support prescribed exercise programs, **self-management and education** that were suitable for their clients

Delivery of remote physiotherapy

What is remote PT good for?

Working remotely promoted a focus on educating and emphasising a **self-management approach** with patients; "*self-management became a lot more important, and I think that's something that me, personally…tried to focus a lot more on that with people".* They enabled an opportunity to focus on behaviour modification, goal setting, and ensuring patients thoroughly understood what they needed to do daily, since the gym or regular physiotherapy sessions were unavailable. Finally, treatment needed to be simple and straightforward so patients could complete it without supervision. The interviewee felt this development was beneficial and had 'carried over' to in-person visits. They reported **no incidents** as a result of their remote physiotherapy delivery.

What is remote PT not good for?

Several patients were triaged to receive remote services but this option was later found to unsuitable, which doubled the time spent on each patient as they needed to be assessed twice. The interviewee felt that remote appointments only saved time for a few patients as the set-up process was time consuming for most. Certain assessments and treatments were very difficult to do remotely; '*Assessing things like tone, spasticity, quality of movement - a lot of it you can't do… You can't really assess any kind of proximal stability around the shoulder, you can't access any kind of postural activation.'*

Who does remote physiotherapy suit/not suit?

Obviously, remote physiotherapy was not considered suitable for people who did not met the selection criteria: those who did not have access to, or could not use the technology, could not exercise safely independently or with minimal guidance/assistance or who could not understand how to use the technology or complete the exercises. This encompasses about 90% of the caseload, including patients with **cognitive impairments, complicated communication needs** (including non-English speaking), or patients at **high risk of falling**;

"…English wasn't their first language, we used that to rule people out because at that time, interpreter services weren't really available to us".

Initially age was assumed barrier to remote delivery, but with experience this had been overturned; *"They're in their 80s, they maybe don't have iPads or anything like that. So, how are we going to get these people to just do a video call where they can show us what they're doing. But do you know what, it actually went a lot a better than I thought".*

Technological barriers

The trust insisted that the service use AccurX, which they found unreliable. And was a source of great frustration. The most common problem was **poor quality connection**, resulting in the video and sound being 'unusable'. The physiotherapists investigated a different platform (WhatsApp) which was more useful. However, it is important to note that this did not seem to worry patients to the same extent; *"patients were maybe at home, not seeing their family, not going out as much, so they weren't really too worried if it took longer than needed.'*

Changes over time

Acceptability

Patients became happier with using the technology as they became more familiar with it. However, once lockdown lifted and in-person home visits could resume for all patients, patient preference was often for in-person; *'It was still being offered to people, but a lot of people were happy for face-to-face".*

The physiotherapists saw remote delivery as an acceptable, but not preferable, 'stop gap'; "*we just saw the video calls as an opportunity to treat some people who otherwise would get nothing whatsoever".* Their approach in the future would be to deliver remotely if it was the patient's preference; *"now if somebody said that [I prefer a video call] to me, it would be a lot easier accepted and I would maybe say, fair enough, let's do this video consultation instead…because I'm aware of what you can and can't do"*

Adherence

Although the team was unable to provide quantitative data, they noted better attendance rates and found patients were more likely to tell them if they could not make the consultation, whereas for in-person clinics they often just did not turn up. *"You're more likely to get a bit*

of notice, they're more likely to tell you, "I can't because of this" whereas clinics, people just don't turn up if they don't want to".

Top Tips
• Try to establish an efficient and accurate triage system to identify the patients for whom remote physiotherapy is suitable to capture the time-saving benefits of remote PT delivery. • Develop/access additional digital resources to support rehabilitation. • Try not to make age related assumptions.

Conclusion

This neurological physiotherapy service noted that their triaging needed to be more accurate, and their platform needed to be more reliable for effective remote delivery. They found that remote delivery was suitable for only a few of their patient caseload due to the multiple physical, cognitive and communication disabilities that many suffered. The scope to complete assessment and treatment online was limited because they felt this needed to be 'hands-on'. However, they also acknowledged there was a group of patients for whom it was suitable and even preferable. They plan to return to in-person treatment with the option to deliver remotely where it suits the patient and treatment.

Case study 5: Community Cardiac Rehabilitation Service

What the service looked like before COVID?

The service delivered group cardiac rehabilitation which consisted of in-person exercise circuits delivered in five council venues, with the support of council staff with British Association for Cardiovascular Prevention & Rehabilitation (BACPR) qualification. Classes were delivered by a Cardiac Nurse, a Clinical Support Worker and a BACPR instructor. Assessments were completed before and after the classes. The programme lasted for six weeks, twice a week and included exercise and education. The service used PhysioTools to produce exercise sheets which were r emailed or printed out for the patients.

The interviewee was the only physiotherapist in the team and focused on treating heart failure patient with complex issues. They provided in-person, one-to-one physiotherapy at home, in gyms, and within the class itself. Most patients were white middle-aged men with cardiomyopathies who did not want/could not complete the usual cardiac rehabilitation exercises. The physiotherapist also completed home visits with the occupational therapist to assess mobility needs and safety.

What happened when COVID 19 pandemic hit in March 2021?

At the start of the pandemic the service stopped and the physiotherapist used the time to catch up on clerical activities as they were not offered redeployment. The Trust gave the team 'COVID money' to get their remote service up and running. The physiotherapist consulted with the local pulmonary rehabilitation team who had already established a remote service and used this as a template..

" I work closely with the Pulmonary Rehab team as well…So it was like, oh, what are we going to do? We need to really get something up and running …we already had PhysioTools [a programme to produce individualised exercise sheets] which we used, but we needed something that we thought was very specific… I've been involved, before I came into post, with myCOPD, which is an app that's provided by my mhealth"

There were to choices for cardiac rehabilitation: the 'myHeart' app that had been successful in Scotland and was available at a reduced rate or the 'ActivatemyHeart' app that was developed in Leicestershire and was free to use. They purchased 200 licences of 'myHeart' app using 'covid money' provided by the trust.

The app was made available to patients had the technology – device and wifi and had sufficient digital literacy to use it. There were two options.

1. The 'myheart' app as an online programme that patients could access from their device. It included a complete, comprehensive cardiac rehabilitation programme including along with a virtual walking programme and information on education; mindfulness techniques to help with anxiety; a medication diary; and a section to monitor weight, blood pressure, and any ECG results.
2. Paper-based exercise cards that were personalised to the patient and their condition / ability levels for patients to exercise at home.

This was offered to the people after cardiac intervention or surgery or diagnosed with heart failure. They were given a leaflet explaining the rehabilitation programme and the options available. Then had a telephone assessment before starting their chosen programme.

Methods

Interview

A semi-structured videoconferencing interview was carried out with the cardiac physiotherapist.

Interview summary

The Response to COVID

Initially the team used their 'spare time' as a catalyst for change to reflect on how they wanted their service to progress "*I think we were able to do, in ten months, more than I've been able to do in ten years… I think it's been an absolutely unique opportunity to stop and pause and think, right, what now? To really scrutinise and critique what we did before, in a very objective way, to be able to put the patient at the forefront of what we do".*

Moving to remote delivery was a challenge however, which affected their professional identity and role *"I'm not IT savvy, I'm a physio. I'm a doer. So, you know, I've got all these ideas, but how will you transfer that then from what's in my head to being useful to a patient?"*

Effective leadership

The physiotherapist took an pro-active role straight away and led the changes to the service; *"I think it's been important that I've been visible as a lead, I think particularly early on".*

Development of remote physiotherapy

Organisational support/resources

As well as the buying licences for the app, the team used the covid money from the trust to buy devices to reduce digital exclusion; *"I've got five iPads that we can loan out to patients now, which is really good, and some dongles with some Wi-Fi on".*

Unusually, the team felt they had been well supported by the trust to develop the service and also develop personally to move to deliver care remotely. *"I think the trust has been very good. There's been a lot of skills for IT. We've had a lot of courses to go on to do stuff, a lot of people to ask. A lot of us have stepped up to be digital champions, to be able to help with that. We've had somebody come in post and solely helps with these sorts of things"*

However, **staffing** to deliver an effective digital intervention was a problem; *"I think just more staff to help me [are needed]. I'm the only physio…and I've since said that, but it's been rejected unfortunately, because there's no money in the budget now".* She also referred to another service that had been able to deliver virtual classes because they had the resources to do so. *"She's got a bank of physios that work on the specialist side of the respiratory, so she's got a lot more manpower than I have, 'cause there's only me, so I couldn't do any sort of Zoom or Teams or anything like that, any sort of virtual classes."*

Plan plan plan

As described above, to make sure COVID money was used effectively, the team evaluated the **cost effectiveness** and ease of use of different apps. They also developed selection criteria to identify suitable patients. The first issue was patients' preference but they also capacity; *"finding out early what the patient wants, and are they in that position to do so?"* and to ensure licences were not wasted. They included patients who had digital resources, were able to use the apps and willing to try digital interventions:

> *"what we wanted to do was make a really good business case to get more [funding]. We've been quite selective with it. So, on the website for the myHeart, there's a little video demo. So we ask the patient, see if they've got stuff [devices and wifi]."*

However, then also planned to expand the service: *"We are moving into working with the council to provide that [the app, devices and programme], so some digital inclusion".* They also reviewed the outcome measures they used, moving from objective measures to ones which were more **meaningful to patients** and could be completed online. They also introduced patient centred goal setting. On reflection, they felt their service was now more **patient centred**; *"We can reflect what we're doing, but it's got to mean something to the patient, and I think that's one massive thing that COVID's taught me, is it's got to mean something to the patient."*

Delivery of remote physiotherapy

Practice practice practice

The staff have found their telephone skills have improved dramatically while delivering remote interventions*; "you've got this much time to get to the root of the problem, to assess the patient, and to find out what the patient wants from it. So, I think I've certainly honed my telephone skills much, much better."*

What is remote physiotherapy good for?

Remote assessments have been found to enable effective follow ups; *"following them up as to whatever that needs, and then reassessing what that is."* Furthermore, digital resources have empowered staff to dedicate time and build rapport with the patients with increasing better understanding and feedback and adherence to the interventions.

> *"we can't see them face to face, but you generally get to get that relationship, get that rapport, and get that really good feedback from them, that they've really appreciated somebody ringing…they'll go back to look forward it, to put it in their diaries, to adhere to, whatever that might be, and I think that's the real, so I'd keep that because I think that's really great."*

Appraising the **outcomes** have been successful through the digital resources delivered by the MDT team as more has been discovered about what the patient wants and what has been achieved against their personal goals.

> *"because we've individually talked to the patient about what's important to them (before it was more group based)…and then at the end of it we've had the time for them to reflect through it, I think that the outcome measures are much better."*

They found that the app supported patients even if they did not want to carry out the exercise element of the programme; *"even if patients don't want either of the choices from the exercise point of view, they've been able to access something else, whether that be education".* Additionally, **staff travel time** has been saved when delivering online digital interventions, and enabled them to spend more time on the phone with individuals; *"I think their initial reaction was, we probably didn't spend a lot of time on the telephone with patients, so they'd perhaps ring up, make an appointment, go out to see them…"*

However, remote delivery has led to the loss of peer support; *"I think the main challenges for us have just been the peer support, because we did run class orientated exercise programmes where there would be 15 patients in one class…that patients could get that support from".* It has also not been suitable for those patients who need mobility aids:
"in our service, wheeled walkers have to be prescribed by a physio and have to be set up by a physio…we've gone out and done a joint visit, because we couldn't over the phone".

Who does remote physiotherapy suit?
Remote physiotherapy suited participants who were able to use digital devices and who did not have complex issues which required in-person support. They were encouraged to access the demonstration video on the app as a way to establish interest and ability. In this services cohort this tended to be white male patients (although this is also their population pre-COVID);

> *"they've got to have a look at the video demo, to know if, there's a bit of commitment. I suppose having the tools to do that rules out some people, and then they would automatically go to the second choice…the majority of our patients we know are white males".*

Changes over time
Patients were quite **accepting** of remote delivery by telephone and staff were motivated by seeing good outcomes with the digital interventions and wished to continue to provide remote rehabilitation when it suited the patients: *"it's what you want to provide for the patient to help them isn't it? So, I definitely want to keep that on."*

However, they doubted whether the Clinical Commissioning Group would pay for this type of service, which they considered expensive in the long term.

During COVID the remote rehabilitation service had better attendance rates compared to in-person classes. The interviewee speculated that this might be because rehabilitation programme was now run directly through the NHS, rather than community venues which patients may give higher priority.

> *"I don't think they see it as an NHS hospital appointment…It's in a leisure centre, it's more relaxed, so I think we had [people who did not attend]. With this [remote delivery], we don't…I think patients, when you tell them that you're going to be ringing them at a certain time, it's very rare that they don't answer the telephone…"*

She felt that having the flexibility for the patient to choose in-person or remote rehabilitation would improve adherence in the future, although the team were aware that it would take effort and a lot of energy not maintain current practice and not slip back in to the 'same old ways'. In terms of job satisfaction for staff it would be important to have a flexible approach to utilising staff skills; *"They'll want a mix of more…all my clinical support workers are very people orientated, because of the nature of the job."*

Top tips
• Find out early what the patients' preferences, needs and expectations are. • Tailor your delivery to them • Do not put a time limit/session limit.

Conclusion

Lockdown gave the time and space to re-assess their delivery and move to a more patient centred service. Careful preparation led to a good response from patients to the app and no technical issues of note. The challenge for the future is to maintain he lessons learnt with a blended service.

Case study 6: Community stroke team

What the service looked like before COVID

Before COVID the service was delivered completely in-person in patients' homes. As well as early supported discharge (seeing patients within 24-48 hours' time frame of hospital discharge) they also six-month review process and offer exercise sessions in local gyms. The service covers a large area, but they have no waiting lists. Patients continue with treatment for as long as they have therapy goals. There are about 50 members of staff in the team including administrative staff, assistant practitioners, nurses, physiotherapists, occupational and speech and language therapists.

What happened when the COVID 19 pandemic hit in March 2020?

The team moved to providing care remotely by video or telephone; with patients who would not be able participate by telephone or video receiving in-person visits. Visits to residential care homes were always in-person. A weekly remote therapy group was instigated (via TEAMS) which lasted 90 minutes. A two six-week group exercise programmes for the upper and lower limbs were also started. Before their first remote group session, patients are seen in-person by a member of the team who completes outcome measures, discusses the patient's goals, and demonstrates the exercises that will be taught in the class. They ensure the patient is set up and knows how to access the sessions remotely. They also provide written/picture instructions for all the exercises and a record sheet.

The outcome measures are then repeated after the final remote group with another in-person session, and the record sheet collected. Family members are welcome to be present during the remote sessions, and are encouraged to provide support as necessary. For each group there is a specific risk assessment taking into account technology, cognition, communication, medical history, mobility, home environment, pain/injury, emotional or psychological factors and caregivers. The service also offers an occupational therapy-led fatigue support group over 4 weeks on Teams and a one-off group presentation about secondary stroke prevention.

Methods

Uptake and adherence (digital exclusion)

Data were provided on the characteristics of the 1563 patients who attending the service March 2020-March 2021 and the mode of delivery.

Patient outcomes

The score on the routinely collected outcome measures collected at the start and end of treatment, plus the change during treatment are presented:

- Barthel Index (Activities of Daily Living (ADL); Modified Rankin Score (mRS) measure of disability.
- Goal Attainment Scaling (the success of goal achievement);
- Nottingham Activities of Daily Living scale (measure of the extended activities of daily living).

Patient Satisfaction

Summary responses from 34 patients to the routinely collected patient satisfaction questionnaire are presented.

Interview

A semi-structured telephone interview was carried out with the team lead. The team member is a band 7 physiotherapist.

Results

Uptake and adherence (digital exclusion)

Data on 1563 patients was available. Patients were typical of the stroke population with an average in the early-mid 70s made available. Unsurprisingly, given the range of impairments and disabilities seen in people with stroke (Table A4.361 and A4.362). In-person care was the most common mode of delivery, followed by the telephone. Patients who used video tended to be a little younger and more male dominated than the overall population (Table A4.362). The amount of treatment varied immensely (Table A4.363) with patients being treated in-person receiving dramatically more treatment. This is unsurprising as patients treated in-person would be expected to be the most disabled.

Table A4.361: Characteristics of patients based on contact type for those patients who received a 6-month review.

	In-person N=551	**Telephone N=618**
Age (Mean, SD)	72.6 (SD14.2)	67.9 (SD13.1)

Female/ Male	250 (45.4%) / 301 (54.6%)	227 (36.7%)/ 391 (63.3%)
Living alone	110*	94*

*there is missing data

Table A436.2: Characteristics of patients for their main method of delivery

	In-person N=542	**Telephone N=482**	**Video N=145**
Age (Mean, SD)	71.1 (SD13.1)	70.4 (SD13.5)	63.1 (SD13.6)
Female/ Male	224 (41.3%)/ 318 (58.7%)	199 (41.3%)/ 283 (58.7%)	47 (32.4%)/ 98 (67.6%)
Living alone[a]	96	78	17

[a]large amount of missing data

Table A436.3: Number of contact minutes

	In-person N=541	**Telephone N=482**	**Video N=145**
Total amount of therapy (minutes, median, range)	540 (5- 8,315	150 (5-1655)	180 (10-2,560)

Patient outcomes

The mean change in outcome measures indicated that, overall all groups improved in all measures, although this was close to the minimal detectable difference for the activities of daily living (Barthel Index) and disability (Rankin Scale). Improvements in extended activities of daily living (NEADL) and Goal Attainment were much more marked. Statistical comparison between groups was not possible but there did not appear to be any differences in improvement between the groups.

Table A4.364: Baseline and Discharge mean (sd) outcome and mean change scores

	In-person			**Telephone**			**Video**		
	Initial	*Disch*	*Change*	*Initial*	*Disch*	*Change*	*Initial*	*Disch*	*Change*
Barthel	15.3 (5.2)	17.3 (5.0)	1.99 (3.4)	15.7 (4.9)	17.7 (4.6)	2.0 (3.3)	16.6 (4.3)	18.7 (3.4)	2.1 (3.7)
NADL	18.3 (12.7)	34.5 (16.7)	16.2 (12.5)	19.3 (13.3)	36.0 (16.5)	16.7 (12.5)	20.4 (12.2)	41.0 (14.1)	20.7 (12.6)

Rankin	2.7 (1.0)	1.9 (1.3)	0.9 (0.9)	2.7 (1.0)	1.7 (1.2)	0.9 (8.5)	2.6 (0.8)	1.6 (0.9)	0.9 (0.8)
GAS	35.1 (5.47)	52.0 (10.0)	16.8 (8.2)	35.1 (5.3)	52.1 (9.8)	16.9 (8.2)	35.6 (3.37)	53.5 (8.0)	17.8 (9.0)

Patient Satisfaction

34 responses were received. Seventeen (50%) received their therapy in-person, four by telephone, two by video conferencing and the rest (15) had blended delivery. The mean score for how valuable patients found the therapy was 4.8/5. Confidence setting up sessions remotely was 4.06/5. 24 respondents found session over telephone and video helpful, with two saying it was not helpful.

Interview summary

The response to COVID

Catalyst for change

Ensuring they could deliver a service to their patients was the stroke team's key driver during the pandemic.

> *"I just had this feeling that there's going to be this group of patients that will have all of these long-term issues and what would we do with them? They've become this COVID generations of patients."*

They were proactive and searched media platforms and other online resources to find out what other services were offering and work out the best solutions for their context, which was a blended approach incorporating in-person, telephone and video consultations.

Working remotely was particularly acceptable to staff who needed to shield due to personal health problems as it enabled them to continue to work and feel valued;

> *"They feel safe, they're at home and they're still doing their job, they still feel valued. It's been a really empowering for them because they haven't felt like that at the beginning, that they weren't part of the team or weren't worthwhile."*

Professional identity

It took the physiotherapists in the team longer to adjust to remote delivery than other clinical staff (e.g. speech and language therapists) because they felt working remotely detracted from the core work of being a physiotherapist;

"The physios, they've been a lot later to the party because there have been a lot of different conversations around the poor patients - my hands aren't going to be on them, how are they going to do this pure movement pattern etc?"

Effective leadership

The team leader had experience of change management within their job role and adopted a can-do attitude supporting staff to look at the options available and driving things forwards and 'bring the team along' and develop strategies to support them;

"*when you look at the successful services versus the maybe non-successful services…the successful services are just enthusiastic."*

"*If I wasn't here, what would have happened? Because I don't know how it would have gone*:

"clinicians took it upon themselves and evaluated the neighbouring services to make their service work during the pandemic"

"It has been very tiring…there's a lot to be learnt about how to do this effectively in terms of promoting team building".

Development of remote physiotherapy

Organisational Support/barrier

During the pandemic there were less restrictions from the trust when setting up the service with COVID rules and restrictions in place, but it was still challenging;

"We did have a lot of the barriers lifted but it was still very slow, like walking through sand… It was like, every leaflet, every bit of patient information has to go through governance."

The team were given the opportunity to be innovative but were also left feeling unsupported at times:

"A little bit more direction from the trust… You were kind of left to your own devices, which did mean you were able to innovate, but also it's made everything really difficult and time-consuming and long-winded".

Staff worked out how to deliver their service remotely without training or resource support from the trust which caused concerns about safety and working conditions;

"I was like, I need to train myself. I just gathered the relevant people to provide training… Anything, anybody we could get, to do CPD sessions, we were doing them. And that's how I upskilled…we had to make our own patient guides".

"After the first/second lockdown, there were no seats, desk, ergonomic headset etc…"

Initially the team used "AttendAnywhere" to as their platform of choice, but an organisational decision force them to change to another platform; "*We were, as a team, the highest user of Attend Anywhere in the trust…they just said, we're moving to e-clinic."*

Plan, plan, plan

The team sought to involve patient feedback thorough out the development and implementation of the remote service. Ensuring patients were safe in their home during remote treatment required careful consideration, planning and practice as many patients had balance problems; "*You always take reasoned risk in the community, but I think when someone has balance issues … you want to be there.* So they adapted the exercises used to focus on lower risk exercises such as chair-based and static exercises and avoided walking and stairs which would be a frequent part of in-person treatment sessions. This was successful as there were no safety related **incidents** while delivering remote therapy.

An important part of community rehabilitation is working with patients help them come to terms and adapt to their disability, which can involve 'difficult conversations. The team were concerned about how these could be conducted sensitively and empathetically when completed remotely.

"Some of the conversations you have around prognosis and all of those type of things, it takes a lot of upskilling, which we are doing, around having those conversations remotely and feeling confident to do that and still maintain your rapport with patients remotely."

The service quickly realised they needed to plan breaks in between consultations as they needed time to 'defuse', reflect or take actions after a consultation; *"There had to be some kind of policy around giving some break in between patients, you can't just roll in from one to the next to the next…you need at least 15 minutes in between".*

As staff became more confident they started to deliver group therapy; *"As we got more skilled, we started thinking about groups, because obviously it's a really nice way to not only have*

socialisation of your patients, but also, again, increase your capacity…and it's a godsend in this time". They did this by sending the patients support material (such as exercise sheets) before they started the programme and also involved two staff members so that one could troubleshoot; *"There's been up to nine in a group and there are two therapists, a therapist and a rehab worker. Obviously you know, the other person is really there for if people drop off or…troubleshooting".*

What is remote physiotherapy good for?

The team felt remote delivery promoted a **self-management and empowerment** and gave patients a greater sense of achievement than in-person care;

> *"One of the biggest things for me was how empowered our patients felt when they do things completely on their own. Even just getting themselves on to a video call on their own".*

Clinicians also found that s remote delivery **saved time and cost while providing more support**;

> *"It was just the rehab support worker going in, but I was there remotely. They can obviously position things, they do everything. They get feedback. It was really good, the patient liked it. It freed up time, I think, and travel costs for the team."*

Time and travel costs were further saved by holding team meetings remotely. The greater convenience led to better attendance and efficiency, so more patients were discussed, *"We 100% do those meetings over Teams now. If you think we had almost 20 people in a room every week…it's been easier to get everyone there on time."*

The interviewee also felt that patient adherence and attendance rates had improved but felt this was due to lockdown as patients could not go out and had nothing else to do, rather than the mode of delivery per se. The service also had **no incidents** in relation to patient safety; *"In terms of incidents, physical incidents, no".*

Who is remote physiotherapy good/not good for?

The clinicians found that planning remote delivery challenging as many patients' impairments and disabilities made it difficult for them to use technology, and these often fluctuated;

"We thought he's just going to fly because he's used to going online, all that type of stuff. But he absolutely hated it, and when we interviewed him, it was because he needed a person there to keep his attention".

The team also noted that age should not colour professionals' perceptions of who would engage.

"In her 80s, completely shielding, and because her daughter had gone round and shown her how to use Zoom… She was absolutely perfect with it…She achieved all her goals with only remote sessions. You choose your toolkit based on the patient in front of you and not one size fits all."

The team and the interviewee were very reluctant to consider any type of algorithm or decision making tool, maintaining that each patient needed to be considered individually as patients had surprised them about the ability to use remote delivery.

Technological barriers

There were technical issues related to data usage especially for staff; *"We're in talks with IT to have all our hardware updated because we go through the VPN, it's remote and staff are using too much data on their phone because they're using different apps".* They also found some patients did not have access to technology, which excluded them.There was one technical incident involving a breach of confidentiality; *" One of the patients, I don't know how they did it, replied to all, to all of the patients … That was a breach [of confidentiality] for them…There was something put in place".*

<u>Changes over time</u>

Acceptability

Over time, staff's familiarity with, and acceptance of remote physiotherapy grew and it was generally acceptable to patient; *"They would prefer if they had the choice to do in-person, but they didn't see it as a lesser intervention".* In the future, the team planned to continue with a blended approach combining remote and in-person contacts according to patients' needs and preferences; *"they may need a lot of face to face because they're going through this certain part of their journey. Next week, we may be able to do a lot more remote. The week after, we may need to do a blended…"*

Top tips
• Get patient feedback as soon as you start setting up the service and continue to get feedback and learn from it. • Look at your service and think, “what do I definitely need to do in-person? What can I do remotely? What are quick wins to start with?” • Do you research and upskill your staff to deliver remotely.

Conclusion

This service successfully delivered a blended service while maintaining outcomes and focussing on patients (often complex multiple needs) and preferences. This was driven by the team leader, from sourcing information for training, developing resources, policies and strategies, to supporting staff to see the opportunities provided by remote delivery. They intended to continue with a blended approach into future.

Case study 7: Private neurological rehabilitation practice

What the service looked like before COVID.

The practice provides bespoke rehabilitation packages to adults and children living with acquired brain & spinal cord injury in the community. They are instructed and funded by the individuals' case managers and solicitors through litigation claims. Their patients vary in physical ability from full time wheelchair users to fully ambulant with cognitive problems and may live alone or are supported by 24 hour packages of care. Whilst they specialise in acquired brain injury, they also treat people with other neurological conditions such as Parkinson's disease, multiple sclerosis who are usually self-funding. All of their patients live in the community. Before lockdown, all treatment was provided in-person but the therapists worked from home and had access to a laptop and smartphone, and their clinical database was accessible remotely via One Drive. However, day-to-day records were paper-based.

What happened when the COVID 19 pandemic hit in March 2020?

The practice stated that the CSP had instructed them to transfer to remote delivery at the start of lockdown[1]. They organised team meetings via Microsoft Teams and decided to deliver remote therapy via videoconferencing. They contacted every patient explained their plan and ascertain their willingness to receive treatment remotely and the platforms/technology available to them. The Practice Administrator then contacted every patient and supported them to set up and try out their platform of choice. Within three days, they had converted 85% of their existing sessions to remote therapy via video link. In the first session, safety of the patients' environment was assessed, as were the support and equipment required and viewing angles available. Patients most frequently chose WhatsApp and Zoom.

Methods

Resources

Data regarding the number of remote consultations and time costs were provided.

Staff experience

The site provided a written reflection on their experience.

[1] Throughout the lockdowns the CSP reiterated guidance from the public health bodies across the UK to members. In the first lockdown this was that in person sessions could only continue with a patients who met certain criteria. In later lockdowns this changed to risk assessing each patient. At no point did the CSP instruct practices to move to remote only.

Interview

A semi-structured videoconferencing interview was carried out with the owner of the practice who also delivered remote physiotherapy.

Results

Resources

Figure A4.371 shows how the practice moved to deliver all care on line during lockdown and subsequently moved to a blended approach in June 2020.

Figure A4.371: Split between delivery type

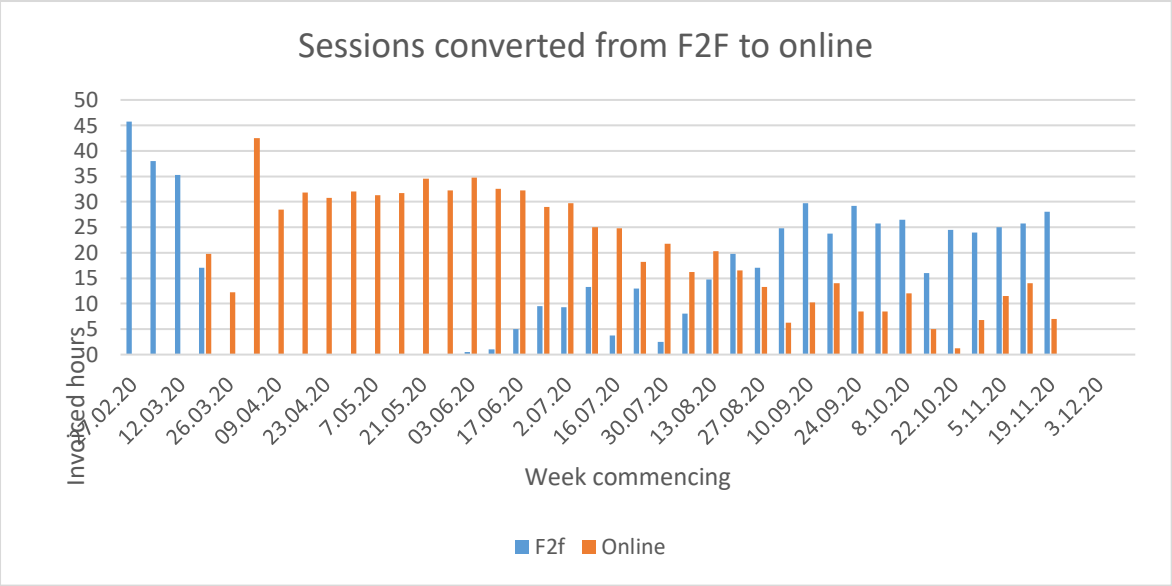
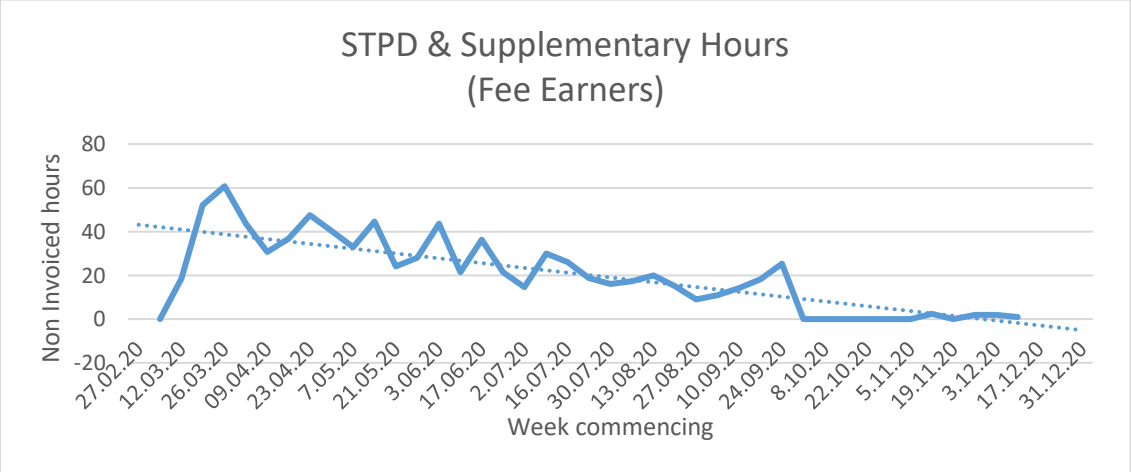


Figure A4.372 shows the amount of extra (unfunded) work the practice did to plan and implement a remote service



Staff experience

Staff reported being surprised about how much support they could deliver without being 'hands-on' and by patients' willingness to engage with remote physiotherapy. They also found that as their confidence grew in terms of what could be delivered, so did their patients'. They started to think about and focus on other skills they could use, beyond physical treatment skills such as motivators, movement analysts, educators and facilitators and problem solvers. They found communication skills were enhanced as they had to rely on this rather than their hands.

They found remote delivery did not completely replace in-person care as there were issues that built up during remote delivery that needed to be resolved once lockdown eased and in-person visits were possible. A further benefit was time and cost saving from reduced travel. However, this travel time was often used to problem solve and reflect on complex situations. Therefore the practice had to adjust their fee structure to ensure time was still made for this important activity. Remote delivery required a lot of preparation in terms of time and resources to ensure sessions were safe, meaningful and realistic. *"What we missed more than anything was travel time, because you get in your car and reflect…"*

Interview summary

The COVID19 Response

As a private practice, there was an imperative to keep the physiotherapy service going despite the lockdown restrictions, so the business needed to adapt to survive.

> *"It was the difference between either furloughing my team and potentially going out of business. That's the hard fact, isn't it? Fighting your corner and doing the best you can."*

At first there were concerns about whether the patients would find remote delivery acceptable and also whether the insurance companies would continue to pay for remote care:

> *"Being a private practice, we were setting up a service that we had no idea if anybody would pay for, so we were going to invest all this time and at the end of the day people could have gone, well, I never agreed to that…somehow physiotherapy provided by a private provider is considered a luxury and not a necessity".*

This service also had to consider the resources needed to move to remote delivery. They felt that some assumed that a private practice would be able to manage the changes easily;

"A private practice can't just buy computers…you don't just set up a computer system overnight, it's about your cloud-based technology, your record-keeping, it's about everything. And they were absent."

Many of the practice's patients had severe disabilities and so they had to be creative to address their complex, multiple needs.

"Our job is to think outside the box and to be creative and versatile. We sat down and it was a case of "well, we've got to give this a go, haven't we, because we have no alternative."

Sometimes in-person physiotherapy was essential, for example when assessing posture or prescribing specialist seating. However to reduce the COVID19 risks, assessments were adapted to the essentials, and other team members attended by video call;

"How many people have to be in that room? There's the family, there's the rep from the company, the OT, the physio. That's all changed. Who really, really needs to be in that room and who can actually join remotely".

Effective Leadership

At first some practitioners in this service were concerned about working remotely and lacked confidence that they could maintain their usual quality of care. A flexible leadership approach was needed to embrace individual's views and needs:

"I think I am now beginning to recognise those team members who thrive on change and those team members who don't respond very well to change… And I think that's what's been difficult for all of us, is that the change has been constant."

It was important that the whole team were involved in the changes and felt part of what was happening. Without the support of the team, remote physiotherapy would not have been successful;

"I t's one thing having the technology, but you've got to have the commitment and the backing of your team and the will."

Development of remote Physiotherapy

Organisational Support/ Barriers

As a small business, the practice stated that they had to develop their remote practice with little support form external agencies, although they did receive some guidance from PhysioFirst (the professional support organisation for private physiotherapists) and the Chartered Society of Physiotherapy. But there were many uncertainties about how the remote delivery would work which was significant burden. *"We did not know if our patients were going to engage. We did not know if solicitors would pay the bill. We didn't know".*

Plan, Plan, Plan

This service saw the importance of **planning and organisation** and *"created a category called Stop, Think, Plan, Do".* **Communication with patients** also invaluable *"Clear communication with patients was important when implementing the changes… so that patients were aware of how the service was going to be delivered virtually".*
They carefully **tested out** how to deliver remote consultations before implementation and the **administrator researched the technology** available to identify most effective and usable platform *"You need to research all the platforms, you need to know what GDPR compliance and responsibilities we've got with them and their pros and cons."*

The administrator contacted patients, helped them set up the technology, practiced using it and **trouble-shooting** any problems before contact with the physiotherapist. *"[The administrators] job is to pick up which patients want to do it, road test it with them, make sure they're comfortable and understand what they're doing."* **Training staff** to deliver sessions remotely was essential, particularly support workers to upskill them in terms of use of technology.

> *"We spent a lot of time teaching support staff to be able to maintain competencies, to be able to go in on a Zoom session, because what you [the physiotherapist] need to do is observe while on a Zoom session"*

The most important lesson learnt was to ensure the patient was in a **safe environment** before starting the session. A **home tour by video** was developed to identify where the patient could exercise safely. Getting a clear view of the patient was often a problem but they found the best positon was for the laptop to be on the floor. They also resolved to modify goals and treatment plans to be less challenging and lower risk if they were not confident about the patients' abilities or the assistance available.

> *"We came to the conclusion that to work on balance you have to work on the*

edge of where balance is and where balance isn't and if there was no other person in the room was that safe to do… so we modified it."

Delivery of remote physiotherapy

What is remote physiotherapy good for?

Sometimes the team found it was difficult to engage with patients remotely, whilst others required support to participate from carers and family members. Working with the **family and support network, promoted patients'** motivation and engagement; "*it was treating the family to get them engaged in an activity".*

Assessment and interventions were adapted to ensure that they were safe, but continued to be patients centred to ensure they were meaningful for the patient. Individualised goal-setting was important here, which was negotiated at the beginning of their treatment package to establish what was going to be possible; *"the first session when the therapists met them was about renegotiating goals and making sure that the patient was on board with what was going to be possible."* The practice had prided itself on its hands-on approach to assessment and treatment but this was no longer possible so they had to rethink how to use other skills, to the benefit to their overall practice.

"OK we haven't got our hands, but we're motivators, facilitators, problem solvers, movement analysers, we're educators and I think we have certainly reflected that. I thought I was a good teacher, but I've become a better teacher."

Working together and supporting each other was an important factor in the success of the remote delivery; *"We meet as a team now, two hours every single week. So that is something else that we've learnt has been the value of peer support remotely, to problem solve, to talk, to connect in a very difficult situation"*. The physiotherapists in the practice worked from home before the lockdown and saw rarely saw each other but this peer support helped to connect and support each other, building team coherence.

Who does remote PT suit?

Children were sometimes difficult to engage and their screen-time was sometime restricted so they did not have access to technology, such as a mobile phone. The service adapted sending out activity packs for children by post alongside the remote consultation *"We found that the children with most disadvantage, were the ones that were very unlikely to own a mobile*

phone… and we found mobile phones and iPads are taken away as a punishment".

Changes over time

As lockdown eased, some in-person visits were possible, after careful risk assessment. In the long-term, the practice felt they would continue with a blended in-person and remote approach depending on patients' needs and preferences. However it could be difficult for staff to co-ordinate in-person and remote consultations in the same day.

If they were completing virtual only consultations clinicians learnt that it was essential to have time between virtual sessions to reflect; *"what we missed more than anything was travel time. Because what we were doing was you get in your car and you reflect…"*
This practice also decided that because of the success of the remote therapy they would not reopen their clinic altogether in favour of the virtual offer and home visits
"We had a clinic and a community team. We have decided, because we have learnt how to work remotely, we have closed the clinic and we will not be opening it again."

Top tips
• Do not make assumptions about who will be able to or won't be able to engage with remote delivery based on age. • Accept that it's different and you cannot do what you would do in-person. • Think outside the box and utilise other resources and skills to engage your patients.

Conclusion

This specialist neurological private practice felt they had no choice but to embrace remote delivery during lockdown. As a private practice, this came with different challenges to those faced by the NHS because it was uncertain if case managers would pay for virtual physiotherapy, or whether patients would engage. The practice owner proactively led the changes, supporting and upskilling staff according to their needs. Staff were creative in their approach, carefully researched the best technologies to use and developed their teaching skills. The service developed additional resources to help children engagement with their therapy remotely and will continue to offer a blended approach moving forwards.

Case study 8: Falls

What the service looked like prior to COVID

The Falls Prevention Service provides specialist assessment and intervention plans to address risk factors for falls in adults. Before lockdown, they completed initial assessments and an eight-week strength and balance exercise programme in a clinic with groups of up to 10 participants and three members of staff. Transport is not provided to these groups. Home visits were also possible as part of the treatment plan (e.g. for home hazard assessment or outdoor mobility assessment). The service accepted referrals from health and social care colleagues and self-referrals.

What happened when COVID 19 pandemic hit in March 2021?

The service had to stop the exercise classes. They were redeployed but started to offer assessment and intervention remotely by phone or video in in June 2020. To achieve this, they restructured how the service functioned. They developed a six-week virtual exercise programme that was designed to be clinically safe and effective. It included falls education and exercises for strength, balance, endurance, bone health and agility. They also created supplementary resources for participants. Each remote exercise session initially involved one therapist, one rehab assistant and up to five patients. The assistant demonstrated the exercises, whilst the therapist provided feedback to patients and resolved any technical issues. Before each session the team ensured safety measures were in place and debriefed afterwards. The exercise programme followed an initial remote assessment, or an in-person home visit if necessary. They identified patients who had access to technology and would benefit from the exercise, provided support to use the videoconferencing including a home visit help set it up if needed. They started to use the Activities Specific Balance Confidence (ABC) Scale as an outcome measure as it could be completed online. An "induction" session was developed to familiarise patients with the videoconferencing platform and what to expect during the programme. A careful risk assessment was also undertaken, ensuring support plans were in place;

> *"We made sure there was support available if an adverse event were to occur e.g. pendant alarm, phone nearby, family aware that patient was exercising".*

Methods

Data collection

Data from the team's quality improvement project are presented.

Uptake/Attendance/adherence

We present patient demographics for in person physiotherapy before the pandemic and those receiving a remote service.

Patient outcomes

Two-thirds of patients were assessed in-person using Berg Balance Scale (BBS) [1], 30 second Sit to Stand [2] and FES-I [3] so compare outcomes for the remote and in-person service.

Patient and staff feedback/satisfaction

Two online surveys assessed patient and staff satisfaction before and after the programme.

Results

Demographics of people attending in-person or remotely were similar (Mean age 77 years, range 43– 97 years and 79, range 47– 90 years respectively).

Uptake/Attendance/adherence

Attendance at both remote and in-person programmes were good but slightly better for remote delivery (90% vs 75% respectively). Six (26%) patients dropped out of the remote classes because they were unwell, had poor connection or left the country. 82% of patients completed the remote programme and progressed onto community-based exercise facilities compared to 76% of in-person classes..

Patient outcomes

There were no substantial differences in patients' level of ability before receiving remote or in-person exercise classes and no differences in outcome (Table A4.381). Improvements for in person BERG could suggest dynamic balance was challenged more in the in person classes when compared to remote but then other outcomes reflect more improvement for the remote classes,

Table A4.381: Patient outcomes*

	Remote service N=23	In-person service N=66
Berg Balance Scale Mean at baseline (point change at discharge)	Mean 45 (3)	Mean 41 (7)
30 seconds sit to stand Mean at baseline (point change at discharge)	Mean: 7 (3)	Mean: 8 (2)
Falls Efficacy Scale (FES-1) Mean at baseline (point change at discharge)	Mean: 15 (4)	Mean: 14 (1)
ABC Scale Baseline (Discharge) scores	43% (55%)	N/A

*Data presented is in the format shared by the service and standard deviations (SD) are not available. The evaluation team have not had access to the raw data.

Patient satisfaction

Eight patients (47% of those who completed who completed their remote rehabilitation reported they had a 'very good' or 'good' experience.

"I can see the huge amount of time, care, expertise and thought that you have all put into fashioning this programme."

"You have created a warm club-like weekly get- together full of such useful tips! To say nothing of the exercises which have certainly shone a light on my problem areas".

Patient suggestions for improvements included videoing the exercises, a better videoconferencing platform, better sound and more sessions.

Staff satisfaction

5/11 (45%) of staff (two rehabilitation assistants and three physiotherapists).reported they had a 'very good' or 'good' experience delivering the programme They found it reached clients and provided good interaction. Suggestions for improvement included better connectivity, to use of another platform, sending reminders and links more regularly, wireless headphones and more administrative support for trouble shooting.

Interview summary

The Response to COVID

Although some staff were apprehensive about remote delivery, the team together to develop the new programme. Working together to utilise every staff member's skills was important.

"They really pulled together as a team whilst determining the best way to utilise the skills of individual staff. The rehab assistants were an older workforce so appropriate duties and tasks needed to take into account their level of computer literacy".
"There was a good team work ethic where everyone contributed to the redesign of the service. This included creating new resources and adapting old processes".

Implementation of the remote exercise programmes relied upon **careful planning** to ensure they were safe and effective. The team worked collaboratively and joint decisions were made, for example the choice of education topics; structure of the programme; evaluation processes, ways to improve patient safety (the exercises were adapted to include more cardiac and less dynamic balance) and individual's roles. They **tested** assessment and intervention processes thoroughly before implementation. Staff needed to adapt the way they delivered the programme remotely (e.g. speed of speech, camera positions to ensure patients had a good view, instructions).

"Therapist led the education component, RA [rehabilitation assistants] led and demonstrated the exercises whilst the therapist observed and provided verbal feedback about technique/performance and dealt with any technical issues. This was all planned beforehand".

They adapted the BERG balance scale from objective **assessment** to a self-rated scale completed over the phone;

"We created our own version of the BERG [balance outcome measure] where we asked patients to rate what they could do using the different items of Berg to inform the tailoring of exercises. This helped us create an individualised home exercise programme based on self-reported ability".

Staff training was needed to be able to use the platform and run and facilitate the programme remotely. Laptops were found to be more effective than tablets for health professionals to deliver the group but they then had to use tablets;

"We had put in a technology order before COVID for new devices and lots of staff went for tablets because they are light weight and easy to take to peoples' homes. The

tablets were not ideal for the class and have caused a few issues with angles and views."

Delivery of Remote Physiotherapy

Practice, Practice, Practice

There were some challenges with remote exercise classes, some patients needed support from their family to manage the technology and some technical difficulties interrupted the flow of the session and sometimes meant that a patient was unable to continue. The service therefore organised initial set-up session with patients to ensure the technology and view was good. Two members of staff always ran the group so that one could take over if the other had technical failure. Clinicians sometimes found it difficult to see what the patient was doing on camera or to correct them in a virtual group if they did an exercise incorrectly, without drawing attention to the individual. If needed, a one-to-one session was offered after the group to ensure good technique. Using breakout rooms had been tried but found infeasible. The ability to share screens (videos and images) during educational section of the session was beneficial.

Being prepared, trouble shooting and practicing were all essential to ensure that the group delivered was safe, effective and enjoyable, *"We made sure there was support available if an adverse event were to occur e.g. pendant alarm, phone nearby, family aware that patient was exercising".*

What is Remote PT Good For?

The remote programme enabled patients to participate in a safe, effective exercise group which would not otherwise be available to them.

The service also found that remote consultations aided **multi-disciplinary communication**;

"We have carried out MDT meetings via Teams and this is something that we would keep as it has helped bring the 3 boroughs together to share discussions about patients and has enabled consultants to come in and bring advice."

Who does remote PT suit?

This falls service concluded that virtual consultations may not be suitable for all patients, especially those with visual or cognitive impairment or who could not use the technology, which meant some were digitally excluded. As restrictions eased, these people were seen in-

person. However, others who previously would not have **travelled** to a clinic based group did access the remote groups, thereby increasing access and decreasing inequity.

Technological barriers

Some staff felt uncomfortable with the chosen video conferencing platform and many patients preferred to use Zoom, the name of the platform also caused issues:

> *"We would ring patients up and they would get confused thinking we were calling from the "fraud team", so when we started talking about the video conferencing app, patients sometimes hung up thinking it was a crank call".*

Changes over time

As restrictions eased, in person appointments were again allowed and patients could be seen at home if required. The team adopted a blended approach using remote or in-person delivery according to patients' needs and preferences.

Most patients who had access to technology were keen to try the remote sessions and overall the approach was considered **usable and acceptable** for both patients and the service and was safe and effective, *"patients really appreciated the groups and were really happy to be doing something and engaging socially with others as well."* However, as services began to recover and more in-person appointments were allowed this service was keen to get back to their **previous process and procedures.**

Top tips for group delivery	
Preparations	• Ensure staff know how to use VC platform well • Clearly plan and communicate who does what during the sessions • Ensure admin is available to support during the programme to contact patients who haven't joined as expected • Book two rooms with good connectivity so both the Therapist and Assistant can demonstrate exercises while adhering to IPC standards • The day before remind patients about their session (resend the link) • Choose videos and images that will help group interaction and learning • Have an extra session with the patient to check set-up prior to the group • Ensure an extra member of staff (admin) is available to help with VC software.

During the sessions	• Ask patients to position their devices in a way they can be clearly seen by the staff –check if sound is ok etc. • Adjust exercise protocol to fit the needs of each patient with variations to increase/decrease challenge from the standard exercise • Speak slower, clearer and demonstrate exercises before patients begin • Encourage people to share own experiences to promote engagement • Paste the online survey link in chat box and ask patients to complete survey 5 minutes before the end of last group session. Remind those who did not at their discharge appointment

Conclusion

The main advantage of the virtual group was that the service could continue during the pandemic restrictions. This case study demonstrates clear leadership, effective team work, and careful planning and implementation, produced helpful tips about best practice. The choice of application imposed by the NHS Trust was an important factor in influencing confidence in both staff and patients. Although the virtual groups were not appropriate for all patients, the option of remote delivery increased access for patients who might struggle to access in person groups. For those with the technology and the ability to participate remotely, this is being considered as a future option if there is capacity within the team.

Case study 9: MSK and Intermediate Care

What the service looked like prior to COVID

Intermediate Care

Prior to the COVID19 pandemic the physiotherapist worked at a new rehabilitation intermediate care unit. The first two floors are assessment beds for dementia patients, then the top floor was for rehabilitation patients. Therapy was delivered by the physiotherapists going into the unit in-person to deliver support and treatment.

MSK

The service is made up of a MSK service based in the out-patient department and also within GP practices as First Contact Practioners taking referrals from, GPs, A&E, Orthopaedics and Trauma. The physiotherapist worked 80% of their time in clinical work and 20% administrative. Patient notes were saved on the electronic patient record "SystmOne", but it was not used to its fullest capacity.

What happened when COVID 19 pandemic hit in March 2020?

Intermediate care

Therapy to the intermediate care unit was delivered by physiotherapists going into the unit in-person but there were times when, due to an outbreak of COVID, particularly during the 2nd and 3rd lockdown that therapy was delivered remotely, by the interviewee who was working from home as they needed to shield. This was rather unsatisfactory as patients were often admitted to the unit for rehabilitation. The physiotherapists worked with care staff within the unit to teach and support them to help the patients to mobilise and other aspects of their therapy but it was considered a 'stop-gap' necessity.

MSK

The services introduced remote therapy for both one-to-one and group sessions. However, the option for in-person appointments was maintained, so the service was blended for the outset.

One to one remote physiotherapy

The physiotherapist we discussed the service with was shielding themselves so worked from home to deliver the MSK service by telephone or AttendAnywhere. The free Hep2Go service to provide exercise instruction sheets. The caseload included patients with complex

problems such as shielding patients, multi-morbidities, chronic pain, rheumatology, auto-immune conditions and older adults with social issues). Some patients who were referred to them would have been referred to community rehabilitation teams before lockdown. All patients were screened to decide whether they could be seen remotely or needed to be seen in-person using guidance from the trust (Table A4.391). In-person consultations took place in the out-patient physiotherapy department, rather than patients' homes

Table A4.391- Shared decision clinical reasoning guide

Questions to consider
What is the most likely diagnosis based on remote assessment? What would an in person appointment involve? Would an in person appointment change management/prevent deterioration? Discuss patient's risk classification? Do they have to bring a family member to the appointment? As they will also need to be risk assessed.
Patients to be seen in-person
Post-operative surgical patients who • do not had a protocol to follow or do not have the facilities for video consultation • were identified as having an problem requiring treatment at discharge eg. limited range of movement, poor muscle activation Patients with • neurological symptoms needing a neuro assessment • possible joint instability. • history of significant trauma

Virtual groups

The service has a Standard Operating Procedure for remote group exercise sessions using MS Teams. It included clear procedures which outlined what the health professional needed before the sessions started, how to start them; how to deliver a successful remote session and how to close it. It included contingency plans in case of technical failure and involved collecting patients' e- mail and telephone details for secondary contact if any problems arose or further contact was needed. Staff were trained deliver the groups using the standard operating procedure (SOP). They have an infographic and guidance about using MS Teams that was sent to patients before their remote session began. There was also a consent checklist to use with patients before they started to ensure they full understood the safety, technical and governance implications of working remotely.

Methods

MSK

Data were provided by the physiotherapist working from home (while they were shielding) who audited the uptake, attendance and time resources for remote physiotherapy over 8 weeks 07/12/20 – 29/01/21 during the 2nd lock down.

Interview

A semi-structured videoconferencing interview was carried out a band 6 physiotherapist, who was shielding and working from home.

Results

Sixty-two new patients were seen during the audit period, mean age 61.3 (SD 20.9) years, 39 of the patients were female and 23 male, 39 (63%) with broad range of MSK problems. The physiotherapists spent on average 22.6 minutes (range 5 to 90 minutes depending on complexity) preparing for the appointments, 34.8 minutes (range 10 to 60 minutes) in the remote consultation 43.8 minutes (range 20 to 120 minutes) writing up digital notes after the consultation. They then spent a further 15.5 minutes (range 0 to 30 minutes) organising additional resources to be sent to them. Thus, on average remote first appointment took a total 117 minutes, mostly by telephone (N=54, 87%) patients, with only 8 (13%) patients choosing Attend Anywhere. There were 100% attendance, which was greater than in-person appointments.

> *"Since lockdown, my DNA [attendance] rate has been good, I've had no DNAs from new patient contacts, they've always been there. When the technology hasn't worked, I've always managed to get through to the patients on the phone. It's about 5 or 7% DNA or UTA on follow-ups. This is pretty good with respect to department efficiency."*

Eighty-one patients were seen for 'follow up' appointments (ie after the initial assessment) during the audit period. On average, the physiotherapist spent nine minutes (range 0 to 40 minutes) reviewing notes, scans etc before the follow-up consultation; 18.3 minutes (range 0-30) delivering the consultation; 15.5 minutes (range of 5 to 40) writing up notes and 8.5 minutes (0 to 30) providing further information and resources after the consultation. Thus the total (mean) time spent for each remote follow up appointment was 51.3 minutes, mostly by

telephone consultation (n=70, 86%), Seven (9%) patients chose AttendAnywhere and 4 (5%) communicated through email. Attendance was good (n=71, 88%) with 6 (7%) who were unable to attend and 4 (5%) who did not attend without notice.

Interview summary

The response to COVID

Catalyst for change

Most of the physiotherapists from the MSK service where redeployed to the wards when COVID19 pandemic started in March 2020 and the remainder set up the remote service. Importantly, for the interviewee, this allowed them to continue to work even though they were shielding at home.

Professional identity

The pandemic and the move to remote delivery made the team reflect on the way they had previously worked and whether that was best practice, but also on this new way of delivering physiotherapy.

> *"Now you look back on it, and you think, well, should we really have been doing it like that, you know? Why weren't we doing phone calls and stuff? But, it was just traditional, it's something you've always done and you just do it. It wasn't really questioned, it was just, you know, that's physio."*

> *"You didn't really sign up to physio to be a desk job really. You know, you wanted to be doing something active with people".*

Development of remote physiotherapy

Organisational Support/barriers

The trust gave the staff training to enable them to deliver online interventions remotely. However staff found they did not have time to complete it

> *"We have had sessions preparing for remote delivery. There was a bit of a thing, in terms of privacy and setting up the room correctly, so you've got appropriate lighting and things like the headsets*."

> *"I was told about some Zoom training, if you're delivering group sessions and things like that, really, and just how to best do those, but I've not yet had chance to watch*

them."

The trust also enabled more flexibility in the way they worked so they could adapt treatment pathways to individual patient's needs to help them carry out their physiotherapy at home.

Plan, Plan, plan

During the pandemic, the MSK service used the British Medical Association's COVID-19 risk assessment score card to identify which patients to see remotely and which needed to be seen in-person.

> *"You can't really tell people what to do, but if anyone's high risk really, above six, I think it is, on that score, is not allowed to come in for a face to face really. The moderate risk, I think it's three to six…you'd have to weight it up and ideally not bring them in but can do if you do need to. The low risk it's not so critical really…we're not actively encouraging people to come in if you can get good outcomes just remotely".*

The staff worked together to put a **pathway**, starting with a telephone call to decide whether the patient needed to be seen in-person or remotely in subsequent appointments;

> *"even if they just go once just to get assessed properly, and then I can do it over the phone. The other physiotherapists pass patients back to myself, it is fine really. I think we're all in agreement, that we don't mind sending patients each way, as long as we're getting the right person for the right job."*

The interviewee found the **telephone** was most patients' technology of choice and could used as a second 'back up' connection when online platforms failed. However, they learnt that from experience that this was fail-proof

> *"Many patients do not pick up their telephones at first attempt. Then I ring them again, and then they're always there. I just know it's coming now. It's how it is. But, the appointments, I can still keep to time".*

They also learnt to used emails for communication with patients, which was a new development

> *"I have had a few patients that I have given bits of advice via email. I've got an NHS.net account, so it's safe…if it was too in-depth I'd probably ring them".*

The physiotherapist found the electronic patient record (SystemOne) was time saving as they could see the patient's history before the first assessment.

> *"Talking wise…40 minutes for a new patient and 20 minutes for a follow up, and you just go through the patient story, you've kind of had a read of SystmOne, so you know some of the story anyway. So, I think the technology does help that aspect really."*

Delivering remote physiotherapy.

Practice, practice, practice

The physiotherapists found having a second **family member** with the patient during remote consultations helpful in case they needed help with their exercises (safety and technique) and to give encouragement; *"as long as they're doing the right things safely, and you've got someone to motivate them, within that situation you're probably going to get as good as you can".* They also created a **list of resources** for patients to use during the consultation;

"It's basically just a crib sheet of all helpful bits of advice, telephone numbers. If I'm talking to someone on the phone, or Attend Anywhere I've called it useful stuff, telephone numbers, email addresses…"

What is remote physiotherapy good/not good for?

The interviewee felt that remote physiotherapy enabled them to **continue to practice** and protected their role while shielding, even though it had been a challenge at times. They particularly liked the telephone as they did not feel the **pressure to maintain appearances**;

> *"Normally face-to-face you have to be very professional. Some people can have very high standards, and they can put you edge…whereas, on the phone it's just another voice at the end of the telephone*."

They found that remote delivery facilitated and empowered patients to self-manage their condition, to the extent they sometimes felt more like a lifestyle coach than a physiotherapist; "*I suppose people have got to self-regulate, and self-manage, so you've got to empower them towards this".* Video conferencing also enabled them to see patients' **home environments** which produced *"a deeper understanding of the patients overall situation".*

Remote working enabled them to **manage their time** more effectively, with greater flexibility and fewer distractions.

"Often the physios will now do the triage or admin or telephone calls from home. I think there's more flexibility to set up your days how you want to. Also team meetings, it's much better to not have to travel an hour to get to a meeting, I do feel like I'm doing more work. I think a few people have said that really. Just 'because you haven't got the distractions".

However, remote physiotherapy was also demanding; *"one of the issues is probably the volume of screen time. I've found the last two or three weeks really intense with a complex patient caseload".* It could also be difficult to carry out **objective assessments** and ensure **patients were safe**, so assessments had to be adapted.

"Over the phone you've got to make a judgement about how safe is it to ask someone to be doing something that you have not seen. For example: if it's a lady with Parkinson's, and you're trying to assess her back, I think I did this in sitting, just as a precautionary thing really".

It could also be harder to develop a therapeutic relationship in the same way when working remotely; *"I don't feel they have the same kind of connection, particularly with the phone, it's just a person at the end of the phone. You kind of miss the rapport, when you're with someone…"*

Who does remote patient suit?

The remote service was **beneficial and feasible for all ages**, although they found younger people were better able to engage with Attend Anywhere and older people tended to prefer the telephone; "*There are some of the more senior people who have given it a go but they usually prefer the telephone or face to face".* The physiotherapist has found that remote consultations were difficult when the **patient's first language was not English**;
"I've had one non-English speaking person on the telephone, and his daughter was translating. I ended up arranging for a face to face appointment."

Change over time

The physiotherapist and their team were generally **accepting** of remote physiotherapy, especially as part of a blended service offer but highlighted for ongoing review;

"Everyone's happy to be doing it, and it seems to be working as a blended kind of thing. I mean I think the technology will be fine to use in the long term, it's just

something new so you've got to keep analysing the pros and cons and any associated complications associated with much more sitting/screen time".

"Anecdotally the physiotherapists have appreciated the move towards technology, and utilising remote therapy. This was mentioned in general conversations before COVID, but it was forced by the pandemic".

Top Tips
• If working across GP practices and hospital services set-up a system with colleagues that is flexible and works for patients. • Utilise exercise prescription tools and emails to help support patients. • Create a resource list to utilise during consultations • Use visual analogies when giving instructions for movement.

Conclusion

Overall the remote MSK service for has been found to be beneficial for clinicians and patients, and particularly welcomed by physiotherapists who were shielding. However, a service was blended from the outset and this is how the team intended to continue.

For the intermediate care unit, remote delivery was a means to an end to ensure the patients had access to some sort of treatment during COVID outbreaks but long term the service would return to in-person care. Support and educate care staff to assist with rehabilitation was already being implemented before the pandemic and continue in the future.

Case study 10: Community pulmonary rehabilitation service

What the service looked like before COVID

The service provides a Pulmonary Rehabilitation programme which includes group exercise, education, and a personalised management plan for patients with COPD whose function is affected by their disease (MRC 2+ with functional limitations), Interstitial Lung Disease (ILD) and Bronchiectasis. It is delivered in a group-based setting and offered in three different locations to ensure patient access, with patients attending twice a week for 7 weeks. Each session lasted for up to two hours with one hour of exercise and up to one hour education programme. On referral each patient was triaged by telephone followed by an in-person clinical assessment (Table A4.3101). The team received 583 referrals in 2019-20. Due to the demand on the service, there was an eight month waiting list (n=215) before the pandemic.

Table A4.3101: Clinical assessment

• Demographics • Chest History and current presentation • Medical history • Height/weight/BMI • Current medication/Inhaler review • ADL review • Anxiety/panic • Goal Setting • Objective Examination (odema/clubbing/cyanosis/hyperinflation/ BP / RR/Pulse/SpO2/Auscultation) • Incremental Shuttle Walk Test • Consent for National Asthma and COPD Audit Programme (NACAP) • Falls screen

On completion of the programme, outcome measures and the patients' individual goal plans (to record clinical improvement) were completed. The team worked closely with Leisure Services with well-developed referral pathways to other activities on discharge. To ensure that transport was not a barrier, patients had access to transport.

Table A4.3102: Staffing

Senior practitioner Band 7 physiotherapist - 1 WTE Band 6 senior physiotherapist - 0.6 WTE Band 6 senior occupational therapist – 0.8 WTE Band 5 rotational physiotherapist – 1WTE

Band 3 Patient support worker – 1 WTE Band 2 administrator - 0.6 WTE

What happened when COVID 19 pandemic hit in March 2020?

At lockdown, the team were redeployed to assist hospital discharge and rapid response teams until 1st June 2020 when they started to plan a remote rehabilitation programme using 50 licences for 'SPACE for COPD' (a clinically evidenced virtual programme) which were made available to them. It was chosen because it could be personalised to each patient, was a six-week pulmonary rehabilitation programme with space for patients to report their progress. Therapists could review patient engagement and progress before 'approving' the patients' move on to the next stage of the programme. It was also found easy to use and promoted motivation, but was heavily text-based. One-to-one exercise sessions with the therapist delivered via AccuRx were also used. When the licences ran out it was replaced by, another app (MyCOPD) and a YouTube Channel which the team developed and populated in September 2020. Three pathways were developed to ensure equitable access for all patients referred to the service (Table A4.3103).

Table A4.3103: Service pathways

Pathway 1	**Pathway 2**	**Pathway 3**
Web-based remote programme following objective clinical assessment at home, 1st exercise session in person (optional) then weekly phone/video follow up calls. Patients have access to an app; one-to-one exercise sessions via AccuRx and the Trust Pulmonary Rehabilitation YouTube Channel.	As for pathway 1 except the exercises are presented on paper rather than virtually. Patients do not use the app or Youtube channel.	Declined or not suitable for the remote programmes), but suitable for pulmonary rehabilitation. So waited for the restart of traditional in-person delivery, which restarted in one venue in November 2020.

Implementation of the remote pathway.

The team screened all patients on the waiting list for suitability and interest in a remote programme. Staff were familiarised with the SPACE for COPD programme to ensure they were able to support patients. As a service, the team also took this an opportunity to work towards being a paperless service to further improve efficiency and quality.

Methods

The service provided demographic, outcome, adherence and patient satisfaction data for the two remote pathways.

Outcome measures collected include the

- COPD Assessment Test (CAT) where higher scores denote a more severe impact of COPD on a patient's life. Minimum Clinically Important Difference (MCID) for CAT is a reduction of 2 or more.
- Chronic Respiratory Disease Questionnaire (CRDQ) where an increase in the score reflects an improvement, The minimum important difference (MCID) in the CRDQ is 0.5 points per item within each domain [1],
- MRC breathlessness scale which quantifies the disability associated with breathlessness by identifying when breathlessness occurs when it should not (Grades 1 and 2) or by quantifying the associated exercise limitation (Grades 3–5), the higher the score the more breathless the patient [3].
- Sixty second Sit to Stand Test is used in pulmonary rehabilitation to assess exercise tolerance in patients with the more sit to stands carried out showing higher levels of tolerance [4], an MCID of 3 or more stands has been established.
- Handgrip is used as a measure of muscle strength and frailty levels, a MCID has not been established for hand grip strength (HGS)

Patient experience/satisfaction data

Patient questionnaire using a 5 point Likert scale was used with a rating from very poor to very good.

Interview

A semi-structured video interview was carried out with the team lead (Band 7) who also delivered the remote pathway. Their role included service development and quality and co-ordinating team activities. They were newly appointed to the role when the service reopened in June 2020.

Results

Uptake, adherence

31 people accessed the paper based remote service and 22 patients chose the web-based remote programme (Table A4.3104). All participants in the web programme (Pathway 1)

were all white British. In pathway 2 (the paper programme) (3.2%) was white Irish, 1 (3.2%) was Pakistani and 1 (3.2%) had another Asian background. Most had COPD. Those taking the 'paper programme' attended (on average) 8 sessions (range 6 to 13) and those on the 'web programme' averaged 9 sessions (range 7 to 14).

Table A4.3104- Patient characteristics

	Pathway 1- Remote (Space) N=22	**Pathway 2- Paper based N=31**
Gender	14 Male; 8 Female	9 Male; 19 Female
Diagnosis	20 (90.9%) COPD; 1 (4.5%) Other chronic lung disease; 1 (4.5%) Interstitial lung disease	29 (93.5%) COPD; 1 (3.2%) Bronchiectasis; 1 (3.2%) Interstitial lung disease

Patient outcomes

On average, patients on both programmes showed that the COPD had less impact on their lives (CAT score) as the change in scores exceeded the minimal clinically important difference (MCID). The only aspects of the respiratory distress question which changed was fatigue in the web-based programme and emotional fatigue function in the paper programme. However, as the variability (standard deviation) of the change scores for both parameters was large, it was unlikely this was statistically significant. The change in sit-to-stand score were not clinically significant in either group. Although the scores for breathlessness (MRC Scale) and hand grip strength improved in both groups, the clinical significance could not be assessed. There were no apparent differences between groups in any outcome.

Table A4.3105- Weeks intervention and outcomes

	Pathway 1- web-based n=22 (mean/sd) Assessment/discharge/ change	**Pathway 2 Paper based, n=31 (mean/sd) Assessment/discharge/ change**
CAT score	20.9 (6.81)/ 16.3 (7.69)/ 4.62 (5.68)	20.9 (8.35)/ 17.89 (7.70)/ 3.15 (4.09)
CRDQ Dyspnoea Fatigue Emotional function Mastery of disease	 3.2 (1.6) / 3.5 (1.7) / 0.2 (0.9) 4.3 (1.8) / 4.9 (1.8) / 0.5 (1.0) 3.8 (1.8) / 3.9 (1.7) / 0.2 (1.3) 4.4 (1.7) / 4.8 (1.9)/ 0.4 (1.0)	 2.8 (1.3) / 3.2 (1.8) / 0.4 (1.2) 3.7 (1.7) / 4.0 (2.1) / 0.3 (1.6) 2.8 (1.4) / 3.2 (1.8) / 0.5 (1.1) 4.1 (1.9) / 4.2 (2.3) / 0.1 (1.7)
MRC	2.9 (1.2) / 2.7 (1.0) / 0.23 (0.5)	3.4 (1.3) / 3.1 (1.4) / 0.31 (0.5)
60 sec Sit to Stand	19.8 (6.7) / 21.9 (10.4) / 2.1 (7.0)	13.3 (9.4) / 15.7 (12.4) / 2.4 (7.8)
Hand Grip Strength	27.3 (14.6) / 28.2 (16.0) / 0.91 (4.8)	19.3 (no sd) / 21.5 (no sd) / 2.2 (4.4)

Patient satisfaction

Fifteen questionnaires were returned, eight respondents were male. Most were aged between 65 and 74 years (range 45-84) and all respondents were white British. All rated the support from staff as 'very good'. Twelve participants rated the remote exercise sessions 'very good', with three participants rating them 'good'. Seven patients found it 'extremely/easy to access videoconferencing' on the web-based remote pathway, with two patients who were neutral and the reminder did not use the videoconferencing. Patients reported

> *"Appreciated the guidance of the course by either notes or video and liaison with the staff".*
> *"I thoroughly enjoyed the programme although there was a computer glitch which delayed me moving from module 2 to module 3"*
> *"Wife had to input onto the iPad for me".*

All patients were extremely/likely to recommend the remote programme to family or friends but some would have preferred to attend a group rather than exercise alone.

Dropout rates were low across all three pathways, and those who discontinued did so for medical reasons. The interviewee thought this may, at least in part be because patients had and had fewer commitments during the pandemic. During winter, attendance rates for in-person classes usually drop pre-covid because people with COPD are at high risk of chest infections during cold weather. However, this was not the case for the remote programmes as patients did not need to travel or go outside to attend, thus reducing the risk of infection; *'' I imagine attendance is very good because it's an agreed time, it's flexible, it works around them. So I suppose it's difficult to DNA (do not attend)."*

Interview summary.

The response to COVID

The pandemic, along with the new team leader was a catalyst for change. Under new leadership, the team took the opportunity to 'go paperless'. Case recording, and team discussions and meetings were all done electronically, which was a big change. GP referrals fell during the pandemic was an opportunity to reduce the waiting list, as well as introducing the remote rehabilitation programmes; *"we've improved so much there isn't a waiting list anymore and there's not many referrals…we've got three different pathways that are absolutely smashing it"*. Although the team were positive about the new way of working,

there was also some apprehension about how it would work and how patients would react; "*how it was going to go down, where shall I stand, is it going to work, how are the patients going to take to it".*

Effective Leadership

When the new team leader came into post, their line manager was already keen to introduce a home-based rehabilitation programme and helped them to drive it forward;

> *"she (line manager) obviously pencilled in this idea of utilising SPACE and having this home programme. But then when I came in June it was very much clinically led because we knew an idea what the patient wanted".*

The team leader had previous experience of using technology and remote delivery and felt their **confidence** encouraged the team and gave them confidence that it could work.

Development of remote Physiotherapy

Organisational support/resources

It took a while for the service to obtain the **equipment** they needed for remote delivery, but this was also the case for delivering in-person care.

> *"It must have been September, possibly October time. It (equipment delivery) started dripping through…about early January I picked up a laptop stand, laptop, mouse, mouse mat".*

L**ack of office space** to maintain social distance, poor ventilation and natural light, **insufficient electrical socket points, headphones, desks, computers, electronic gadgets** and exercise equipment were also problems. Not all the staff had the space at home to work there effectively. The team initially used the 'SPACE for COPD' app the community services manager managed to get free licences, but there was not really any training provided and they had to use their own initiative to work out how it should be implemented;

> "*Space for COPD, we were given a staff guide, but that literally involved how to log in... Saying that, we used our own initiative and we gave ourselves a license so we could be a patient, that was our test account".*

Plan Plan Plan

A **triage system** was devised which considered patient fitness to exercise, abilities to engage

with the programme remotely, their preferences and the service capacity to decide which pathway a patient would follow.

> *"make sure they're medically wise okay, have they got a lung disease, how is it confirmed, are they suitable as in mobility, cognitive wise, any past other history... A support worker or myself will ring them up…right, we've got three options for you, virtual, home based, group...they opt for one of them".*

The team had to adapt their assessments so they could be done remotely, substituting the incremental shuttle test with the 60 second sit-to-stand test (both measures of function and stamina). They decided to make the first assessment in-person for all pathways because they felt it was necessary to see how the patients were able to function when active:

> *"People with irregular heartbeats, high blood pressures, bradycardia, things that we've had to check. We wouldn't have been able to do that as easily if we did it virtually."*

The team created all the resources to support remote delivery including booklets and a YouTube channel which demonstrated the exercises. This was particularly popular with the patients,*"Nn the My COPD app there's an exercise component, but in our opinion it's not very good, hence why we have the YouTube channel*."

They started using SPACE COPD initially, which was reported to be better than MYCOPD. The licences ran out for SPACE COPD and the service moved onto MYCOPD but had to create additional resources including a special YouTube station with recorded exercise sessions ,which were available to patients to complement to the programs on relevant pathways. The participant indicated the YouTube channel presented patients with better set of exercises than those provided on My COPD app; *"on the My COPD app there's an exercise component, but in our opinion it's not very good, hence why we have the YouTube channel*."

<u>Delivery of remote physiotherapy</u>

Practice, practice, practice

The booklets and all the digital resources were sent to the patient before the start of the programme to help them prepare; "*so a link to the education, link to the introduction page, link to the exercise videos.''*

What is remote physiotherapy good/not good for?

The remote programmes were reported to be advantageous for patients who were in employment as it offered **flexibility about when they took part.** Other benefits were that it offered a **safe space with** no infection risk and **no need to travel;** *"They [the patients] think it's fantastic, and I do as well. I can sit here from 50 miles away and carry out my treatment.''* The interviewee explained that the remote service, effective triage and reducing the length the programme from 8 weeks (pre-covid) to 6 weeks (during covid & ongoing) enabled them to reduce the long-standing long patient waiting list. They were able to make evidence-based decisions to assign patients to the most relevant pathway and start the programme more quickly than before lockdown from a patient perspective, they found the app motivated patients;

> *''The best thing about [the app] is it encouraged a lot of exercise…They [the patients] can't go to stage two unless they've done stage one…they have to upload an exercise log before they can move on".*

However, remote delivery was less effective for delivering education, which they felt was better delivered in-person in a group setting;

> *"the education is impaired with remote. I think one of the best things is the education aspect in a class. You sit down with them and we go through a certain topic each week and you get them to interact as a group and they share ideas.''*

The interviewee reported that no **adverse events** had been encountered during remote delivery except one patient received spam which caused distress;

> *"One elderly chap, who we thought maybe could be a candidate for the virtual was given a Survey Monkey and at the end he completed a questionnaire and then another survey came up and that was more spam. Information governance had to look at it because something happened with their access level, allowing spam".*

Who does remote physiotherapy suit/not suit?

Remote services were described by the physiotherapist as primarily attended by younger middle aged patients; *"the ones who opt for pathway one are the younger ones, the ones who are working, the ones who are used to using tablets and laptops for work".* They found patients had very few problems with it. Older patients tended to opt for the in-person delivery due to frailty and less familiarity with technology. Remote services take up among **ethnic**

minority groups were reported as low and the physiotherapist perceived this could be due to lack of resources.

They felt it was hard to estimate which pathway and patient group had better outcomes as the characteristics of those attending each pathway differed At times **family involvement** was the deciding factor governing whether the patient could follow the programme remotely.

Change over time

During the remote rehabilitation programmes, the team maintained weekly contact with patients which was considered a key factor for success. There was good **acceptability** with the patients who it was deemed suitable for, but the service lead also talked about the fact that a successful remote pathway enabled them to **resist redeployment** in the January 2021 lockdown, they wanted to continue to offer a remote pathway going forwards;

> *"There's still patients coming through asking for the three pathways. There's no bias at the minute for one or the other. I'm still seeing virtual patients. So for me in my job I'm getting to deliver all three pathways every week and the team are doing that and the patients, it's their choice. As long as the evidence backs it up.''*

Top tips
• Create additional resources (digital and paper based) to support exercises that are personalised to your local service. • Have flexibility of offer so you can meet the needs of all of your patients and offer remote where appropriate.

Conclusion

This service successfully set up 3 pathways of delivery during the COVID19 pandemic of which one was a remote pathway. They found that the remote pathway worked well, particularly for those who were still working as it was flexible and could fit around their work patterns. In terms of outcomes, the data suggests similar improvements across all pathways and similar satisfaction levels with clinically meaningful changes in outcomes. The service had very few technical issues with the apps or the video conferencing platform. They did have to put quite a bit of work into preparing resources but took the opportunity to look at the service delivery when there was a reduction in GP referrals to the service because of the

pandemic. Moving forwards they will continue to offer the 3 different pathways unless their data or evidence suggests that they should not.

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Case study 11: Private MSK occupational health and sports injuries clinic

What the service looked like before COVID

A traditional, private physiotherapy practice based in a city centre, working in a clinic, gyms and clients' workplaces. Clients self-referred through their website, consultants and other specialists or third party referrals. Many clients were of working age, coming into the clinic on their way to or from work or on their lunch breaks. Physiotherapists in the clinic worked on a freelance basis for this private company.

What happened when the COVID pandemic hit in March 2020?

The future was very uncertain as clients immediately disappeared from their booking system as lockdown came into effect, because they were no longer working in the city centre and gyms closed. It was also unknown whether private medical insurance would cover remote physiotherapy services.

Methods

Uptake, adherence, DNA's

The service also provided data about attendance rates and destination on discharge.

Patient outcomes

Outcome data for 105 patients discharged between November 2020 and January 2021 were provided, using a 10 point likert scales to measure self-reported improvement and pain.

Patient satisfaction

Twenty-three patients completed a patient satisfaction survey in April 2020.

Interview

A semi-structured teleconferencing interview was carried out with the clinical director with a 20-year experience.

Results

Uptake, adherence, DNA's

Between March 2020 and January 2021 the non-attendance rate was 7.5%, 60% were discharged from the service with no further treatment required, 20% referred for in-person physiotherapy, 20% referred for onward referral (eg imaging, orthopaedic review). Clients

attended an average of 4.06 physiotherapy sessions. However, unlike other sites, attendance rates were very high before lockdown and actually fell initially as clients were not coming into the city centre, but then increased again as the remote services became established and the team's confidence grew.

Patient satisfaction

43% (10/23) of clients completed the feedback form. Six clients rated their satisfaction as 5/5 with four rating it as 4/5. 8/10 (80%) patients would gave a 5/5 when asked whether they would recommend the service to others, with 2/10 patients giving a rating of 4/5.

Patient outcomes

Data were provided on 105 patients (approx. 10% of patients referred). Fifty-eight percent of patients had at least 70% improvement since starting physiotherapy, and 90% reported an improvement in function, with similar numbers reporting reduced pain.

Interview summary

The response to COVID-19

Catalyst for change

At lockdown, the practice's clientele disappeared so out of necessity, they immediately began discussing and implementing online delivery. The clinical director had previous experience of triage and consultations by telephone so began to use these skills and to support the other staff to do so. *"I hope if COVID has taught us anything else is that we have to be flexible in our approach to life."* They accepted quickly that they needed to change not only how they delivered their care but also they type of care they offered and were eager to involve patients as much as possible. They focused on what they *could* deliver, for example they focused on patient education and ergonomic and wellbeing webinars. The service also started to work with different companies to change their referral pathways and searched for secure online providers.

> ' *Having to rethink how we provide services has actually opened so many doors for us which perhaps weren't there, or perhaps we weren't looking because we were in a very, you know, face-to-face…so actually, it's been a very challenging but actually a very rewarding experience as well.'*

Professional identity

Rather than focusing on loss of in person delivery of hands-on therapy, this service focused on what they could offer patients, maintaining their professional identity by ensuring their services were still patient centred;

> *"At the end of the day this isn't about me. This is actually about a patient, this is actually about another person. So if I can help them as much as I possibly can, I've got to take away some of my beliefs and some of my challenges and actually make this work for all of us.'*

Effective leadership

From the outset, the director was determined that lockdowns would not prevent them providing quality, valuable, patient-centred physiotherapy, which they attributed to their '*stubborn nature'*. They also relied on years of management experience in to discuss attitudes and behaviours openly and honestly with their clinicians;

> *'I think the challenge is when the clinician hasn't been prepared to change their practice and has just insisted that they continue practicing as if they were in a face-to-face clinic. You can't. And then they've become frustrated and it's like, "well, you can't do that so you're going to have to think of another way of doing it or not do it at all."*

They acknowledged it was up to them to develop and build their staff's confidence to work with technology (which in turn, encouraged clients to engage with the remote service). They promoted the benefits of remote PT and the new opportunities to work in different settings, with different demographics and conditions. *T*ime and resources were also put in to help the staff change their practice, teaching them how to use their time most effectively, providing new tools and support to learn how use them and reminding them of their transferable skills. They encouraged the team to **think outside the box**, by adapting **assessment processes for example** or getting the patient more involved in their own care.

> *'It was very much, this is going to be your best way of using it [remote delivery] and if you think of a better way, then tell us please, and we'll amalgamate it…So if your patient says, "can't get in because of ABC" these are your top 10 tips to help them get on. And again, if they can't get on, then go onto the phone and ring them'*

They also promoted the benefits to their clients, pointing out the increased access to the health services that remote working offered as clients would not have to take time off work, or worry about the travel or parking. It was about making virtual appointments so easy to access that it would be hard for the patient not to try it out; *"The clients are're like, "No, this is perfect for me, it means I haven't got to worry about childcare, I haven't got to take time off work, so no, this is great".* However, if after all of their guidance and support, the physiotherapist was not right for remote work, they were confident enough to say so.

Development of remote physiotherapy

Organisational support and barriers

Being a small, private company, the interviewee recognised that they were able to move more quickly than many physiotherapy services, *"I think we've made it work for us. Sorry, we're a very optimistic company"*. They also recognized quickly that the working age demographic and conditions of their clientele would be ideal for remote services as nearly all could access and use the relevant platforms.

Throughout the interview, the director emphasised the importance of a well-functioning patient management system (the Clinko platform) which they considered a "game changer" by keeping everything they needed all in one place (email, texting function, audit trails for all methods of communication, functioning links, reminders, count down clocks etc). In addition, they also invested in the Physiotrack exercise app to further enhancing the online experience.

Delivery of remote physiotherapy

Practice, practice

The team began practicing goal setting and self-management techniques. They felt patients were more engaged and motivated as they were more involved in their own assessment and treatment, in contrast to hands-on treatment when the patient is passive; '*they're buying into the session and they're buying in with what's going to happen next.'*. Also the treatment happened in their own home/environment and the exercises were done in real time, with whatever equipment the patient had available making the sessions **real and relevant**.

What is remote PT good/not good for?

Reach

This big advantage of remote delivery was that it increased the practice's 'reach. The staff were able to treat patients anywhere, even outside the UK. In addition, it extended their operating hours to include evenings and weekends; *'If I was in the face-to-face clinic, there would be very little chance I'd be doing a Saturday morning clinic, but as I'm at home, I am"* Remote physiotherapy particularly worked for those with families, those working from home, especially those avoiding the commute into a busy city.

Self-management

Remote delivery also brought practice 'back to the basics of self-management', involving the patient in their care, as well as goal-setting, prioritising and pacing. They observed that patients tended to be more invested and motivated in their treatment sessions and their outcome; *"very rarely, I'll have patients come back to me and say, I couldn't do the exercises, because they've already done them in their home setting"*. The physiotherapists observed that clients made fewer excuses for not adhering to exercise schedules or other aspects of treatment regimens as the therapist could adapt the exercises to their home environment and encouraged the patient to use whatever was at hand in the house during the video call.

What is remote physiotherapy not good for?

The team missed opportunities for day-to-day interaction with each other physiotherapists, and it was a real challenge to build relationships with new staff. As a result, the director made an extra effort to schedule team and one-on-one meetings to encourage and support their employees.

Initially, team members were concerned about completing assessment remotely as they were worried about *"missing something"*. However, if they felt that the patient really needed hands-on assessments (such as reflexes), referral pathways were in place to ensure that the patient was seen in-person.

Who does remote PT not suit?

The team found it a challenge to deliver physiotherapy remotely with non-English speakers, although it could be possible if extra time was allowed. They also found a small number of patients wanted to be seen in-person even if remote care was suitable for them. Conversely, some patient insisted on remote consultations even if the therapist thought it was best to see

them in-person;

> *"do you want face-to-face because actually some of your symptoms, it might be better placed to have like a blended approach and manual therapy and exercise, and whatever else. And they're like, no, this is perfect for me."*

Changes over time

Acceptability

Patients who did not accept remote delivery, were seen as the biggest challenge for the service;

> *"When somebody's like, "nah, don't want it", that's possibly been the hardest thing. I suppose you feel like you've failed them and yourselves in some way because you know that actually you can still provide an awful lot of what they may need. But with time, that's got easier to deal with.'*

Despite their patient-centred service and enthusiasm for remote delivery, some patients had not taken up their first video appointment or existing patients had not returned when they were only able to offer remote consultations.

> *"We had a lot of existing patients who didn't come back. Either they thought they could carry on at home, or perhaps they found someone local to them who were still open, or they felt online's not going to work*".

In the future, the director anticipated the service would retain the remote delivery, which would be their main way of working.

"It may be that we don't reopen the physical clinics because although they're easy to run, it's very challenging to build up your caseload and actually it's [lockdown] given us other opportunities to work online, perhaps more exciting opportunities than opening a clinic. So I think we're most likely to stay online."

Top tips
• Acknowledge that you cannot deliver remotely what you deliver in-person • Think outside the box'. • Communicate with each other • Share what works and what does not when delivering remotely. • Establish a well-functioning patient management system

Conclusion

Lockdown had a profound impact on this practice as they immediately lost their clients and had to establish new referrals and new ways of working to survive. A quick, carefully researched, clearly led response produced a successful, reliable platform and digital system. Working remotely increased the practice's reach who could now provide physiotherapy nationally and even internationally when clients travelled abroad. In the future they planned to be mainly a remote service and are unlikely to re-open all of their clinics.

Case study 12: Children and adolescents tertiary neurological service

What the service looked like before COVID.

The physiotherapist in this case study was part of a tertiary NHS service for children with neuromuscular disorders, based in the hospital out-patient department. Before the pandemic, patients with these long-term, progressive conditions were normally reviewed in clinic by the multidisciplinary team every 6, 12 or 18 months. There were no remote services so patients would have to travel into the clinic for their appointments.

What happened when the COVID pandemic hit in March 2020?

When lockdown started, all outpatient appointments were cancelled and the physiotherapists moved to work on the wards. However, within 12 weeks, they re-established the review clinic using Zoom.

The administration team contacted their patients offering a remote appointment and explaining how it would work. Patients who were unable to use Zoom, had an appointment via telephone. This was welcomed by many families as *'it was a lot better than not having appointments"* and as the patients were clinically vulnerable many were shielding; "*a lot of them not wanting to go out, you know, really worried, really anxious."*

It would also save transport costs for both patients and the trust. As a tertiary service, patient were drawn from a very large/region area and often had to travel long distances to attend in-person. Not only was this expensive but often uncomfortable and difficulty, especially for those with more severe disabilities.

Methods

A semi-structured video conferencing interview was carried out with a band 7 physiotherapist in the neuromuscular team. No supporting data or documentation were provided.

Interview summary

The response to COVID-19

Catalyst for change

Before lockdown, the service operated in-person with all patients travelling to the out-patient clinic. They had been considering more flexible modes of delivery but, lockdown accelerated this - to the extent it felt *"everything happened overnight"*

Development of remote physiotherapy

Organisational support

The interviewee felt unsupported as, although keen for the service to 'move to remote', their NHS Trust did not provided any training on using Zoom as a platform, nor on how to deliver their services on it, or how to deal with difficult situations.

A driver for the move to a remote service was lack of space as waiting areas and clinic rooms were too small for social distancing, increasing the need for effective triaging. Patients with urgent problems were seen in-person and those with non-urgent issues were given the option of being placed on the waiting list for an in-person appointment or to be seen via videoconferencing. This worked well with sufficient patients choosing to be seen via Zoom

Plan, plan, plan

The service had an administration support team who contacted the patients in the first instance to help them set-up and use Zoom for remote physiotherapy appointments. This support was obviously a great help for the physiotherapists.

Initially staff were apprehensive: *"It was a bit scary to start with. Well, not scary, but it was a bit sort of like, how is this going to work?"* This was eased by careful planning of the remote sessions and how all eventualities would be managed; *"Have a plan, you know…as to what you are going to ask them, where you're going to go, I tend to treat it like any other assessment really*".

With time, the teams' skills and confidence grew as they understood what they could and could not do during video appointments and also learned from their patients, many of whom were of school-age and using Zoom regularly for their school lessons.

What is remote PT good for?

Using Zoom also led to a significant improvement in attendance at their Multi-Disciplinary Team meetings and consequently, service-wide communication, and consequently patient care improved. They were also able to include other specialties discuss the needs and treatment patients with complex problems something had been impossible previously due to the lack of space at the hospital;

"What's quite interesting is that you get many more people attending those meetings…We were trying to, at that stage, still work out what we were going to do with our own patients that weren't being seen. And so it was quite useful to be able to, you know, catch up."

As the physiotherapists had only seen patients in clinical before lockdown, they found it an advantage to be able to see patients in their home environment; *"We had some quite interesting tours of the house, because they would say…this is the new shower chair my child has got, or this is the new hoist".* This had enabled them to notice problems at home that they may not have otherwise, allowing for proper referral to social work services. The service also moved to promote the patients' ability to **self-manage** their condition, but this was hampered by the closure of many community facilities such as swimming pools.

A particular challenge for this service was that their patients were children, often young children and so the physiotherapists were dependent on the patients' parents/family to set up the call, manage camera angles and engage the child etc. Attempting objective outcome measures such as stair climbing or the 10m walk test was a particular challenge.

The interviewee found remote calls particularly especially useful for transition appointments;

"When our kids transition to adult services, we don't necessarily do a formal assessment with them, but we introduce them to the adult teams. So actually, that's a nice way of doing it, if you do it via a Zoom appointment"

Who does remote physiotherapy not suit?

The service decided that overall it was more appropriate to see new patients for the first time in-person at the hospital, before considering zoom for subsequent consultations; *"colleagues who I work with…would just say, no…this doesn't work with new patients. You need to be able to see them properly.*" Furthermore, they found remote consultations unsatisfactory when for patients (or their family) did not speak English.

"What we've tended to do, is try and get them in, and have the translator there in the room, because that's the best way of doing it. So yeah, it has been harder with those families".

Changes over time

Acceptability

The interviewee felt Zoom worked *"really well*" but overall, other team members preferred to see patients' in-person so the plan for the future was to use in-person therapy for as many appointments as possible. They had noticed *"zoom fatigue"* setting in and both patients and professionals were becoming *"less enthusiastic"* about remote appointments. Nevertheless, the interviewee would continue to use zoom to get a view of their patients' home and lives, as Zoom worked much better than the odd photograph from patients for the physio to assess or comment on. They would also use it for any quick follow-ups, and any questions or concerns in-between appointments.

Top tips
• Get together with other clinical teams and learn from them. • Have a plan before the consultation so you know exactly what you are going to ask them, where you're going to go with the conversation and treatment. • If you can, engage your administrative team in providing support prior to the consultation.

Conclusion

Remote physiotherapy had enabled this service to continue to monitor their long-term patients and provide self-management support to those who would otherwise have been seen. Working remotely provided an insight into their patient's home environments, which was not otherwise available to them. However, for new patients, remote consultations were thought less useful. They will continue to deliver remote or a blended approach where it is the patient preference and appropriate.

Appendix 4.4: Workshops

The workshops were set-up for us to test our initial findings and results from the survey and the case studies, to check they resonated with attendees. It was an opportunity to gather a patient perspective as we had been unable to identify many patient blogs from our websearch and sites were unable to identify suitable patient forums that were running (due to the 3rd COVID19 lockdown).

Methods

Participants

We set up four Zoom workshops, two for health professionals, one for patients and one for academics who were running other research projects exploring remote physiotherapy. For the health professional workshop we identified sites who were not involved in the case studies but completed the original survey and agreed to be contacted around attending a workshop. To engage with a mix of clinical areas and any clinical areas we had not covered we approached 24 sites. As only sites working in England responded to our initial invitations willing to be part of the case studies we tried to recruit sites for the workshop across the different countries in the UK. For the patient workshops we asked all of our case study sites to send out an invitation to a Zoom workshop on several dates to their patients. We did offer that patients could also attend by telephone if they were unable to access Zoom. Finally, we held a final workshop for academics carrying out research in remote physiotherapy.

Data collection

We started each workshop with a presentation on the main findings from our case studies and then held a semi-structured discussion (based around the questions outlined in Table A4.41). A researcher took brief notes during the workshops.

Table A4.41: Workshop questions

Workshop audience	Questions
Physiotherapists	▪ Do these themes reflect your experiences? ▪ Are there any subthemes that you feel are not fully represented?

	▪ Are you planning to continue with a remote service? ▪ What would support your remote service going forwards? What resources would you like to see?
Patients	▪ Do our themes reflect your experiences? ▪ What are your thoughts on remote physiotherapy in the future, what type of service would you like to be offered?
Academics	▪ Have these themes occurred across your work on remote physiotherapy? ▪ Is there anything that you have found that has not emerged here? ▪ What do you think are the future research questions?

Results

We engaged five sites, with five physiotherapists attending two separate workshops. Characteristics of sites are outlined in the table below (Table A4.42). For the patient workshop five patients (all male, aged between 50 and 75) who attended a community stroke site (site 6) and one patient who attended a community pulmonary rehabilitation site (site 10) attended. Seven academics attended the academic workshop (Table A4.43) working across six universities.

Table A4.42. Health professional workshop attendees

Setting	**Clinical areas**	**Location**	**Patient location**
Primary Care	MSK	England	Rural (settlements with <10,000 resident population)
Mental health care	Adult mental health	England	rural and urban
Occupational Health - NHS	Musculoskeletal; Occupational health; Pain management	Scotland	rural and urban

Secondary Care	Cardiac and pulmonary rehabilitation; Respiratory	Wales	Urban (towns, cities with populations >10,000): Suburban
Community care	Falls	England	Urban s (towns, cities with populations > 10,000): Suburban

Table A4.43: Academic workshop attendees

Name	**Institution**
Dr Lucas Seuren	University of Oxford
Prof Lisa Roberts	University of Southampton and University Hospital Southampton NHS Foundation Trust
Prof Jenny Freeman	University of Plymouth
Prof Monica Busse-Morris	Cardiff University
Dr Kate Button	Cardiff University
Dr Janet Deane	University of Manchester
Anthony Gilbert	Royal National Orthopaedic Hospital/ University of Southampton (NiHR Clinical Doctoral Fellow.

The general consensus across health professional, patient and academic workshops was that our findings reflected their experiences, with no deviation. Below are some additional identified points, mapped against our themes. No new themes emerged. The mental health service discussed how they had not delivered a remote service as it was deemed inappropriate for their patients. This echoed the experiences expressed by our case study sites in relation to their more complex patients with cognitive issues. Patients were generally supportive of remote delivery but stressed that it needed to be offered at the right stage in their rehabilitation journey and that they had to have the appropriate technology, connectivity and ability to be able to engage with it.

Table A4.44: Health professional workshops

	Themes

COVID19 response	• The response depends on how much the therapist/ team wanted it to work. • It is very hard as a service leader to establish consistency across the team when staff have different perceptions of COVID risk and remote delivery risk.
What is remote physiotherapy good for?	• Uptake is better for remote. • Waiting list have been reduced as sometimes it is more efficient • Staff have improved own digital skills, which are transferable • Increase in self-management through telephone advice.
What is remote physiotherapy NOT good for?	• Remote is only good for those that it's good for, the evidence does not show that it is good for everyone. • Peer support is lost with virtual delivery. • Not as easy to engage patients relatives with remote • Staff fatigue- expected to run two jobs (with remote and in-person). • Job satisfaction plummeted as it was felt a physiotherapists role was 'hands on' and remote delivery was more intense. • Difficult to do objective assessment remotely, frightening to accept removing objective assessment from physiotherapy. • Missed conversations and shared knowledge between work colleagues as not in-person. • Harder to bring up some sensitive issues over telephone.
Who is remote delivery not suitable for?	• Patients with mental health issues have high level needs and are unreliable in self-reporting symptoms (wider visual cues in the home need to be considered in person). • Patients with cognitive and communication barriers.
Technology barriers	• Choice of NHS platform challenging
Change over time	• 70/30 (in-person/remote) split is similar to their experience for future • Require more funding for blended approach, if it is to be done well as it will need additional work to set it up successfully. • Some services have discontinued remote delivery and gone back to in-person. • Other sites service delivery documentation (e.g. triage, risk assessments) would be useful for future implementation.

Table A4.45 Patient workshop

Development of remote physiotherapy	• Make it clear what it is for and how it will benefit the patient- what you want them to do and when.
What remote physiotherapy is not good for?	• Necessary for in-person to support exercises after hospital discharge for safety and confidence. • Difficult for physiotherapist to work with differences in abilities between participants. • Confidence around doing exercises correctly.
What remote physiotherapy is good for	• Using remote on phone worked well and could move it around. • Exercises through email were effective, and can keep for reference • Progression from in-person to remote was good. • Remote delivery very flexible. • Saves time and no travel or wait at hospital
Change over time/future	• From four months (post stroke) suggests could go remote. • You need all methods (telephone, video, in-person, websites) • Digital should be an extension of the service (blended service).

Table 4.46 Academic workshop

Staff experience/professional identity	• Physiotherapists feel like they're working in call centre. • This is not why physiotherapists came into the profession. • We need to be educating physiotherapists for a hybrid role.
Development of remote physiotherapy	• Focus needs to be on educating patients about getting around a screen for their appointments. • Physiotherapists need to be trained to deal with distressed patients remotely.
Practice, practice, practice	• Physiotherapists can talk patients into and out of remote or in-person delivery (i.e. POWER of clinician)

What is remote physiotherapy good for?	• Focused on self-management, focused on asking questions and making patient reflect. • Monitoring role for adherence.
Change over time/future	• Physiotherapists want to return to normal as quickly as possible due to 'change exhaustion'. • There is more work to be done around sustaining remote services. • More data needed on time/cost saving.

Discussion

Overall, the workshops confirmed the themes within our case studies with no new themes emerging. Participants across all workshops were in agreement with the overall findings from our evaluation and the recommendations provided.