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# BMJ Open

## Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national survey and progress report

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3 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
4 **survey and progress report**  
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11 **Quasim<sup>7, 8</sup>, Jon Silversides<sup>10</sup>, Andrew Slack<sup>11</sup>, Carl Waldmann<sup>12</sup>, Elizabeth Wilson<sup>13</sup>, Joel Meyer<sup>11</sup> on**  
12 **behalf of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
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**Competing interests**

The authors declare no competing interests.

**Running head**

Post critical illness recovery, rehabilitation, and follow-up

**Word Count**

3625

**Key words**

Critical illness; recovery; follow-up; services; rehabilitation; survey

**Online Data Supplement**

This article has an online data supplement.

## ABSTRACT

### Objective

To comprehensively update and survey the current provision of recovery, rehabilitation, and follow-up services for adult critical care patients across the UK.

### Design

Self-administered, predominantly closed-question, electronic, online survey.

### Setting

Institutions providing adult critical care services identified from national databases.

### Participants

Multi-professional critical care clinicians delivering services at each site.

### Results

Responses from 176 UK hospital sites were included (/242, 72.7%, 95%CI 66.8 to 78.0%). Inpatient recovery and follow-up services were present at 127 (72.2%) sites, adopting multiple formats of delivery and primarily delivered by nurses (n=115, 90.6%). Outpatient services ran at 130 sites (73.9%), predominantly as outpatient clinics. Most services (n=108, 83.1%) were co-delivered by 2 or more healthcare professionals, typically nurse/intensivist (n=29, 22.3%) or nurse/intensivist/physiotherapist (n=19, 14.6%) teams. Clinical psychology was most frequently lacking from inpatient or outpatient services. Lack of funding was consistently the primary barrier to service provision, with other barriers including logistical and service prioritisation factors indicating that infrastructure and profile for services remains inadequate. Post hospital discharge physical rehabilitation programmes were relatively few (n=31, 17.6%), but peer support services were available in nearly half of responding institutions (n=85/176, 48.3%). Acutely, the COVID-19 pandemic required either increasing, decreasing, or reformatting service provision. Long-term service transformations focus on implementation of new, and expansion of existing, services.

### Conclusion

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3 Overall, these data demonstrate a proliferation of recovery, follow-up, and rehabilitation services for  
4 critically ill adults in the past decade across the UK, albeit service gaps remain suggesting further work  
5  
6 is required for guideline implementation. Findings can be used to enhance survivorship for critically  
7  
8 ill adults, inform policy-makers and commissioners, and provide comparative data and experiential  
9  
10 insights for clinicians designing models of care in international healthcare jurisdictions.  
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#### 16 **Word Count**

17  
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19 279  
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#### 23 **Keywords**

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25 Critical illness; recovery; follow-up; services; rehabilitation; survey, peer support  
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For peer review only

## ARTICLE SUMMARY

### STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the largest and most comprehensive survey of post critical illness recovery, rehabilitation, and follow-up services available across the UK
- This survey builds on previous work by examining additional stages of the survivorship continuum, as well as a greater range of services
- Our response rate achieved a representative sample of target sites, which were identified from established national registries, and with multi-professional clinicians providing data
- Limited data on non-responders precludes comparison with responders to detect response bias
- Acquiring one survey response per site, regardless of number, size, or specialty of ICUs at that site may have limited detection of bespoke differences in local service delivery



## INTRODUCTION

Survivorship following critical illness is characterised by varied impairments and disability persisting for many months or years following the index illness and influencing the quality and quantity of an individual patient's recovery. Follow-up of critical illness survivors, and other services such as multi-professional rehabilitation, may be influential in shaping recovery experiences. These services promote restoration of health by primarily identifying and appropriately managing unmet health needs associated with post intensive care syndrome<sup>1 2</sup>. International reports indicate the increasing development of follow-up services of varying structure, format, and content<sup>3-9</sup>; however prevalence data demonstrate how scarce these services can be<sup>10 11</sup>, and there remains no consistent, standardised model of service delivery<sup>2</sup>.

In the United Kingdom (UK), provision of follow-up and recovery services following critical illness is embedded in national rehabilitation guidelines published in 2009 that advocate a continuum of multi-professional input spanning the recovery pathway from ICU admission to community stages<sup>12 13</sup>. A nationwide survey in 2013 reviewing implementation of these guidelines found that only 27% of UK intensive care units (ICU) offered a follow-up service at the recommended 2-3 month time point following hospital discharge, and only 12 (/176) organisations offered post hospital discharge rehabilitation programmes<sup>10</sup>. Lack of funding was both the most frequent, and highest ranking, barrier to providing services, alongside insufficient prioritisation and insufficient personnel and other resources<sup>10</sup>. The intervening years have witnessed increasing attention on recovery services for critically ill patients<sup>14-16</sup>, including the role of peer support<sup>17</sup>. Therefore, the aim of the current study was to comprehensively re-survey the current provision of recovery and follow-up services for adult critically ill patients across the UK to identify unmet areas of unmet need, inform service innovation, and benchmark against clinical standards.

## METHODS

### Service identification

The sample frame was all adult ICUs across the UK (England, Scotland, Wales and Northern Ireland) identified using two central registries; the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme (available at <https://www.icnarc.org/Our-Audit/Audits/Cmp/About/Participation>) and the Scottish Intensive Care Society Audit Group (SICSAG, <https://www.sicsag.scot.nhs.uk/index.html>). A total of 242 individual hospitals were identified from the ICUs listed in these registries.

### Survey development

A predominantly closed-question, online open-survey was designed by the investigators (see Online Data Supplement, ODS E1). Survey content was generated from collective clinical experience and expertise of the investigators using the previous survey as a foundation<sup>10</sup>. Survey questions were sequentially ordered, iteratively refined, with single or multiple response options created for each question, and inclusion of free-text options for further relevant detail. Pilot testing was by three independent, and one internal, critical care practitioners with specialist subject interest and experience. This process ensured content, construct, and face validity, and sensibility, to ensure i) comprehension and interpretation of questions, ii), flow, salience, acceptability, and ease of completion, iii) missing items or response options, and iv) time required to complete<sup>18</sup>. Survey content was also reviewed by members of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group. After refinement and optimisation, the final version was approved by the investigators.

Survey domains were: i) demographics of critical care services; ii) services delivered on inpatient wards after ending critical care, including the transfer process from ICU; iii) outpatient services delivered following hospital discharge; iv) service relationships with other local healthcare infrastructure; v)

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3 peer support programmes; and vi) physical rehabilitation programmes. Respondents were requested  
4  
5 to report their *pre-COVID-19 pandemic* service provision. Any changes to existing, or development of  
6  
7 new, services due to the pandemic were captured.  
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### 10 11 12 **Survey distribution**

13  
14 An invitation email containing the link to the online survey (hosted via Survey Monkey,  
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16 <https://www.surveymonkey.com/>) and a Participant Information Sheet, was circulated via i) Faculty  
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18 of Intensive Care Medicine membership, ii) national critical care networks across each of the four UK  
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20 nations, iii) the National Institute for Health Research Critical Care National Specialty Group, iv) the  
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22 ICNARC Case Mix Programme membership, v) professional contacts of the authors, and vi) related  
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24 social media, that facilitated a snowballing approach to dissemination. Instructions for survey  
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26 completion highlighted the need for a designated lead respondent to coordinate an accurate multi-  
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28 professional response from each site. The survey was open for completion for a period of 8 weeks  
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30 (June – August 2020).  
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### 37 **Patient and public involvement**

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39 Patients were not involved in the design, conduct, or reporting of this research as it was focused on  
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41 surveying current clinical services. However, findings from this survey will inform white papers to be  
42  
43 developed and reported by the Faculty of Intensive Care Medicine Life After Critical Illness Working  
44  
45 Group which includes patient and family representation.  
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### 50 **Ethical approval, data management, and data analysis**

51  
52 The study was approved by King's College London Research Ethics Committee (MRA-19/20-17855),  
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54 and is reported in keeping with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES)  
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56 <sup>19</sup>. Survey completion was considered indicative of informed consent for participation. Data were  
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58 downloaded from the survey platform into Microsoft Excel (Microsoft Corp, Washington, US), and  
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3 stored in password-protected files and devices. Multiple responses for any individual hospital site  
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5 were de-duplicated and amalgamated into one single response set. Respondents were contacted for  
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7 missing or erroneous data, or the most complete and/or first-received response set was used as the  
8  
9 final response option. Descriptive statistics were used to analyse quantitative responses including  
10  
11 normality testing, means and standard deviations (SD), medians and interquartile ranges, frequencies,  
12  
13 proportions, and 95% confidence intervals (CI) where appropriate. Summative content analysis was  
14  
15 used for free text comments<sup>20</sup>. A response rate of more than 70% was considered *a priori* to indicate  
16  
17 a representative sample<sup>18,21</sup>. Analyses were performed in Microsoft Excel and GraphPad Prism (v9.0,  
18  
19 GraphPad Software, San Diego, US).  
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## 28 RESULTS

### 29 Responding institutions

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31 In total 186 (/242, 76.9%, 95%CI 71.2 to 81.7%) individual hospitals registered a survey response. Ten  
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33 blank responses were discounted leaving 176 hospitals included in analysis (/242, 72.7%, 95%CI 66.8  
34  
35 to 78.0%); across the 4 UK nations this comprised Scotland (n=23/23, 100.0%), Wales (n=12/15,  
36  
37 80.0%), Northern Ireland (n=7/9, 77.8%), England (144/195, 73.8%). Demographic data for  
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39 respondent hospitals are reported in Table 1.  
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### 46 Inpatient critical illness recovery and follow-up services

47  
48 All respondents reported processes for managing discharge handovers for patients transitioning from  
49  
50 critical care to the ward (see Online Data Supplement (ODS), Section E2, for further details). Following  
51  
52 this, 127 (72.2%) operated a targeted recovery/follow-up service, established for a median (IQR) of  
53  
54 10.0 (5.0-16.0) years. Twenty sites (11.4%) sites focused solely on outreach readmission prevention.  
55  
56 Key features of services are summarised in Table 2 and ODS (Section E3). Diverse service models  
57  
58 included bedside consultation, education of ward staff around post ICU issues, information provision  
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3 to patients and families, and multi-professional ward rounds. Services were primarily delivered by  
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5 nurses (n=115, 90.6%), physiotherapists (n=70, 55.1%), or intensivists (n=47, 37.0%), with clinical  
6  
7 psychology most frequently cited as lacking (n=55, 43.3%). Referrals were generated from manual  
8  
9 patient-list triages (n=80, 63.0%), automated systems (n=23, 18.1%), or electronic patient records  
10  
11 (n=20, 15.7%). Just over half of respondents (n=69, 54.3%) used a screening tool to identify post  
12  
13 intensive care issues e.g. anxiety and depression, post-traumatic stress disorder, physical and  
14  
15 functional performance, delirium, or psychological status. Funding for services was primarily from  
16  
17 internal critical care funds (n=71, 55.9%) and institutional health service funds (n=45, 30.6%) with  
18  
19 other sources including organisational charities, grant funding, non-critical care departments, or  
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21 volunteer goodwill cover (all <10%).  
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### 28 **Outpatient critical illness recovery and follow-up services**

29  
30 Outpatient services were reported in 130 institutions (/176, 73.9%) established for a median (IQR) of  
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32 9.0 (4.0-15.0) years (Table 3, ODS Section E4). Magnitude of outpatient caseload varied from an  
33  
34 estimated 10 to 500 new patients per year, and subsequent outpatient re-evaluations ranging from  
35  
36 an estimated 0 to 350 per year. An estimated 12,000 patients receive outpatient follow-up per year  
37  
38 (at responding institutions only, out of approximately 117,000 estimated annual ICU admissions). The  
39  
40 predominant service model was an outpatient clinical consultation lasting 30-60 minutes and  
41  
42 scheduled 2-3 months following hospital discharge. Patients are consulted either contemporaneously  
43  
44 (n=77, 59.2%) or sequentially (n=42, 32.3%) by clinician(s), primarily comprising nurse (n=121, 93.1%),  
45  
46 intensivists (n=100, 76.9%), and physiotherapy (n=65, 50.0%) professions. In most services (n=108,  
47  
48 83.1%), a combination of two, three, or more, different multi-professional clinicians ran services  
49  
50 (Figure 1, ODS Table E1). The professional discipline most frequently cited as lacking was clinical  
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52 psychology (n=61, 46.9%).  
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3 Clinician, and self, referrals, were the most common routes to access services. Similar numbers of  
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5 services reported acceptance (n=50, 38.5%), and non-acceptance (n=48, 36.9%), of referrals from  
6  
7 outside the geographical catchment area of the primary hospital (31 respondents, 23.8%, reported  
8  
9 this is as discretionary). Over half of services (58.5%) used a screening tool for post intensive care  
10  
11 issues, with a heterogenous range of outcome measures and/or tools for assessment (ODS Table E2).  
12  
13 Aspects of recovery addressed in follow-up consultations were diverse and comprehensive reflecting  
14  
15 both symptom presentation as well as onwards referrals to specialist services (Table 3); nearly all  
16  
17 included a review of the patient's ICU history (n=123, 94.6%), and for the majority, an opportunity to  
18  
19 visit to the ICU where they had been admitted (n=114, 87.7%). Funding for services was primarily  
20  
21 sourced from internal critical care funds (n=65, 50.0%) with nearly a third underpinned by national  
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23 health service-funding (n=38, 29.2%), and a small proportion unfunded (n=19, 14.6%).  
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### 30 **Barriers and challenges to offering recovery and follow-up services, and links with other services**

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32 Sites without inpatient or outpatient services cited the following barriers: lack of funding (n=35,  
33  
34 76.1%), insufficient staff (n=26, 56.5%), lack of space/venue (n=17, 37.0%), lack of suitably trained  
35  
36 staff (n=12, 26.1%), lack of service prioritisation by management (n=17, 37.0%), resources prioritised  
37  
38 to other patient groups/clinical areas (n=13, 28.3%), lack of evidence to suggest benefit (n=8, 17.4%),  
39  
40 insufficient patient numbers to justify (n=5, 10.9%), and uncertainty regarding content to include in a  
41  
42 service (n=3, 6.5%). Many of these resonated as challenges to service delivery and maintenance  
43  
44 reported by those with existing services (Tables 2 and 3), in particular around issues of staffing,  
45  
46 funding, and service prioritisation.  
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53 Three-quarters of respondents (133/176, 75.6%) reported links between their own and similar  
54  
55 services in neighbouring institutions (ODS, Section E5); categories fell broadly into two themes  
56  
57 reflecting informal knowledge, practice, and service reciprocity, and formal referral pathway access  
58  
59 and coordination. Links with primary care or community interface services were less frequent  
60

(87/176, 49.4%), with examples centring on either direct referral into services, or varied forms of engagement with primary care physicians.

### **Peer support after critical illness**

Peer support services for patients and families were available in nearly half of responding institutions (n=85/176, 48.3%) (ODS, Section E6), predominantly as community or hospital-based support group meetings (n=57, 67.1%). Other formats included peer support groups based within ICU follow-up clinics (n=11, 12.9%) or within ICU (n=5, 5.9%), psychologist-led outpatient groups (n=4, 4.7%), or affiliation with ICU charity-led support groups (n=3, 3.5%).

Peer support varied between informal meetings (n=35, 41.2%), facilitated discussion (n=20, 23.5%), or a structured agenda of talks and presentations (n=9, 10.6%). Twelve respondents (14.1%) reported a 'drop-in' structure, and a further 9 (10.6%) reported a mixed, flexible approach. On average, sessions (of any format or structure) were held a median (IQR) of 4.5 (4.0-9.0) times per year, although absolute frequency ranged largely (minimum-maximum 1.0-52.0 per year). Participant attendance was a median (IQR) of 10.0 (6.0-15.0) former patients and 6.0 (5.0-10.0) caregivers. Staff input was multi-professional; critical care nursing staff being involved in nearly all services (n=81, 95.3%), with intensivist (n=40, 47.1%) and allied health professional (n=39, 45.9%) staff involved in nearly half, and psychologists in 17 (20.0%). Most services were not affiliated to any formal networks (n=49, 57.6%), but where they were (n=33, 38.8%), this was primarily with national networks (ICU Steps (<https://www.icusteps.org/>, UK), n=27, 81.8%, InS:PIRE ([www.nhsggc.org.uk/inspire](http://www.nhsggc.org.uk/inspire), UK), n=2, 6.1%). Four services (12.1%) were linked with the international CAIRO network (Critical and Acute Illness Recovery Organization, <https://sites.google.com/umich.edu/cairo/home>).

### **Post hospital discharge physical rehabilitation programmes**

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3 Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31  
4 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26, 83.9%), or in  
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7 combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or  
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10 rehabilitation assistant (all n=1, 3.2%, each). One programme was led by an exercise/sports therapist.  
11  
12 Clinicians leading programmes were either ICU-specialist (n=19, 61.3%) or rehabilitation-specialist  
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14 (n=12, 38.7%). Details of the structure, format, and content of physical rehabilitation programmes  
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16 are reported in the ODS (Section E7).  
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### 21 **Future plans**

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23 Respondents' comments about future plans for their services (within 2-5 years), in terms of instigation,  
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25 development, or expansion, were themed into categories (Table 4). The main two themes centred on  
26  
27 expansion of current, and establishment of new, outpatient services.  
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### 32 **Impact of the COVID-19 pandemic**

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34 Nearly all respondents (n=162/176, 92.0%) described the impact of the COVID-19 pandemic on  
35  
36 services. Themes characterising these effects (and frequency of occurrence) were: i) existing service  
37  
38 capacity/activity increased or decreased (54.3%), ii) existing service changed to telephone or virtual  
39  
40 (45.7%), iii) new services implemented (phone-based, face-to-face, virtual, or exercise) (35.2%), iv)  
41  
42 applying for funding/new service (27.2%), v) existing service increased in frequency (12.3%), vi) follow-  
43  
44 up combined with respiratory medicine services (12.3%), vii) no change (10.5%), viii) shortened  
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46 interval between review appointments (6.8%), ix) addition of psychologist to service (3.7%), x)  
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48 research about follow-up initiated (0.6%). Full details of respondents' narrative comments are  
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50 reported in the ODS (Section E8).  
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## 59 **DISCUSSION**



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3 Findings from this comprehensive national survey characterise the continuum of multiprofessional  
4 recovery, follow-up, and rehabilitation services currently provided for adult critically ill patients across  
5 the UK. A remarkable expansion of outpatient follow-up services is evident, whilst post hospital  
6 discharge physical rehabilitation programmes remain relatively low in number. Peer support services  
7 available in nearly half of sites support its importance for contributing to survivorship. Lack of funding  
8 commonly precluded service provision, and logistical and prioritisation barriers indicate that  
9 infrastructure and profile for services remains inadequate. Projected 5-year sustainability of services  
10 will require improved referral pathways, clear standards for guidance, greater medical engagement,  
11 enhanced links with primary care, and improved profile, but encouragingly themes of service  
12 expansion and new service development feature as future plans.  
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### 28 **Interpretation of the findings**

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30 More than 70% of sites provided targeted longitudinal follow-up support to patients on the wards  
31 following ICU discharge with more than half incorporating screening for post intensive care syndrome.  
32 This is in keeping with recommended practice <sup>12</sup>, and signifies a practice of early identification and  
33 management of problems as well as onwards recovery planning. Comparative data on prevalence of  
34 inpatient recovery services are limited; one smaller previous survey reported only around one-third  
35 of sites were guideline-adherent on ward-based input following critical illness <sup>22</sup>.  
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46 Increased prevalence of outpatient services at 74% of institutions, compared with 27% previously <sup>10</sup>,  
47 is striking, and vastly exceeds international counterparts <sup>11</sup>. Underlying factors behind this  
48 considerable growth are unclear, but greater appreciation of the long-term consequences of critical  
49 illness from within the clinical community could be speculated given that half of services were funded  
50 via internal critical care sources, many were delivered within existing roles without dedicated  
51 additional time, and clinician referral to services surpassed objective criteria. Scheduling of follow-up  
52 was also adherent with national recommendations <sup>12</sup>. However, uni-professional service delivery by  
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3 nursing staff prevailed despite the empirical value of other disciplines, and even though  
4 representation from clinical psychology doubled in outpatient compared to inpatient services, this  
5 was the most frequently reported missing profession from both. This emphasises both the need for  
6 investment in personnel, and the urgency of addressing psychological morbidity in survivors <sup>23-25</sup>,  
7 which can influence engagement with other aspects of recovery, and contribute to hospital  
8 readmission <sup>26</sup>,  
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12 Engagement with primary care reduced from inpatient to outpatient stages of management.  
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14 Increasing partnership with primary care is key to optimising quality of critical illness recovery <sup>27</sup>;  
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16 greater hospital resource use compared to non-ICU hospital controls <sup>28</sup>, and unplanned 90-day  
17  
18 hospital readmission in around one quarter of cases <sup>29</sup>, are evident in survivors. Qualitative  
19  
20 exploration of unplanned hospital readmission highlights many contributing themes that primary care  
21  
22 clinicians would be ideally placed to support during recovery e.g. multimorbidity, polypharmacy,  
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24 inadequate social support, and challenges with specialist equipment <sup>26 30</sup>. Information provision on  
25  
26 patients' ICU admissions and their consequences could be a simple yet effective and valued strategy  
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28 to start <sup>31 32</sup>. Furthermore, advocating a routine appointment for post intensive care patients with  
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30 their primary care clinician to review status early in the community stage of recovery.  
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44 Post hospital discharge physical rehabilitation programmes also increased since last surveyed. That  
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46 this increase is much more modest (from 7% to 18%) may be multifactorial, but one possibility is the  
47  
48 relative 'burden' of leading the delivery of such services by only one profession, namely physiotherapy  
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50 - lack of sufficient staff features highly as a barrier in the current dataset. Broadly, the structure,  
51  
52 format, and content, of delivery of physical rehabilitation programmes mirrored previously reported  
53  
54 findings, albeit two thirds of programmes still utilised referrals to other bespoke rehabilitation  
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56 programmes e.g. pulmonary and cardiac, to manage unmet need even though these may not cater  
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58 optimally for patients following critical illness <sup>10</sup>.  
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5 Peer support benefits patients, relatives, and staff during survivorship<sup>16 33 34</sup>. Six models are described  
6  
7 by the international Society of Critical Care Medicine Thrive Peer Support Collaborative<sup>17</sup>; our data  
8  
9 indicate a predominance of community-based peer support with no evidence for online delivery,  
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11 albeit this may have evolved in the interim due to pandemic restrictions to physical in-person meeting.  
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13 Barriers and enablers to peer support services have been explored through focus group inquiry with  
14  
15 clinicians<sup>15 17</sup>. As peer support continues to embed within the armamentarium of post critical illness  
16  
17 recovery, including for patients surviving post COVID-19<sup>35</sup>, these barriers and enablers should be  
18  
19 contextually applied to each model in order to foster greater availability of all forms of delivery, and  
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21 to ensure individual participant preferences for mode of engagement with peer support are met.  
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27 Lack of funding most often precluded delivery of critical illness recovery and follow-up services,  
28  
29 followed by availability of sufficient staff; these, and other findings on reported barriers, closely mirror  
30  
31 previous data<sup>10</sup>. A key issue affecting funding and deliverability is disparity between commissioning  
32  
33 processes, often at national and local level respectively for inpatient and outpatient critical care  
34  
35 services. This disconnect fails to reflect the continuum over which recovery occurs from ICU admission  
36  
37 to discharge home, and the attainment of individualised goals of recovery. Reliance on bespoke local  
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39 commissioning applications to source funding therefore directly affects equity of access to critical care  
40  
41 outpatient services. Key to application success are the strength of national guidelines, quality  
42  
43 standards, patient/caregiver value, and the observation from care quality commissioners that  
44  
45 inpatient services are impacted positively by outpatient follow-up. However, these empirical-  
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47 reported benefits are often insufficient to secure funding, as reflected in this survey, because they are  
48  
49 frequently countered by demands for evidence to demonstrate clinical and cost effectiveness; at  
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51 present neither follow-up clinics or post hospital discharge physical rehabilitation programmes are  
52  
53 supported by meta-analysis data<sup>2 36</sup>, and there is an absence of consensus on the most appropriate  
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55 metric to reflect 'success'. Evidence-gaps exist around the optimum version of either modality, and  
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3 the service-user voice is often missing in shaping research <sup>16</sup>. Reliance on internal funding sources to  
4  
5 deliver services results in the disparity in workforce composition seen in our findings.  
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10 How much the COVID-19 pandemic influences the current landscape of critical illness recovery, follow-  
11  
12 up, and rehabilitation services, in the long-term remains to be seen <sup>37 38</sup>. Our findings indicated both  
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14 'positive' (e.g. service expansion, addition of professional specialties) and 'negative' (e.g. lack of  
15  
16 resources, loss of physical in-person contact) impacts. We also detected a signal towards service  
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18 digitisation, albeit this would require careful management to prevent issues such as digital poverty  
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20 and literacy from limiting access. Follow-up clinics, underpinned by large-scale UK national funding,  
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22 aim to address short- and long-term sequelae affecting patients the UK <sup>39</sup>, and recent international  
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24 data <sup>40</sup>, as well as empirical reports of local service development. We posit that the current data,  
25  
26 detailing existing national services at a granular level, may be informative for future commissioning  
27  
28 and policy-makers in directing resources towards services for *all* patients recovering from critical  
29  
30 illness, irrespective of causal illness or injury, to ensure evidence-based provision of care. A blended  
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32 payment model for critical care services, incorporating an outpatient tariff within the outcome  
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34 element would be transformational, enabling the standardisation and improvement in the equity of  
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36 access of these services for patients across all four nations.  
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### 43 **Critique of the method**

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45 This study benefits from a number of strengths. Sampling was through two national registries, and  
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47 survey design was rigorous and comprehensive, including external pilot testing. The inclusion of *in-*  
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49 hospital services increases the value of the current dataset that now provides detailed  
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51 characterisation on available services across the continuum of critical illness recovery. Survey  
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53 platform functionality was maximised to mitigate respondent burden or fatigue <sup>41</sup>. Survey  
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55 dissemination adopted multiple methods and respondents represented a wide range of professions.  
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3 This approach facilitated a high response rate exceeding our *a priori* threshold for representativeness,  
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5 with minimal missing data.  
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10 We encouraged a coordinated multi-professional response from each institution anticipating  
11 enhanced accuracy of data. However, any limitation in availability or cooperation of colleagues could  
12 hypothetically have impacted the quality of responses. Furthermore, limited data on non-responders  
13 precluded comparison with responders to detect presence of any response bias<sup>21 42</sup>. For pragmatic  
14 purposes we sought one survey response per hospital, regardless of the number, size, or specialty of  
15 ICUs at that hospital. However, some bespoke differences may exist in recovery and follow-up services  
16 according to ICU specialty that were not detectable in the current survey. Where more than one  
17 unique hospital was part of a single overarching healthcare provider, we still required an individual  
18 survey response per hospital to account for potential inter-hospital differences in services.  
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32 Our data reflect UK National Health Service provision (as of mid-2020), potentially impacting  
33 extrapolation of findings to other healthcare jurisdictions. However, the multi-centre national-level  
34 data clearly demonstrate a wide range of recovery and follow-up services of varying structure, format,  
35 content, staffing, and delivery, and from a diverse population of hospitals. As such, clinicians from  
36 other international healthcare settings could consider elements for potential adaptation and  
37 translation into local services.  
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## 48 **CONCLUSION**

49 This study provides a comprehensive snapshot of the UK landscape of post critical illness recovery,  
50 follow-up, and rehabilitation services, including an indication of the impact of pandemic  
51 circumstances. These data complement national and international efforts to optimise quality of care  
52 and outcomes of survivors of critical illness.  
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### **AUTHOR CONTRIBUTIONS**

BC, AS, CW, and JM conceived and designed the study. All authors contributed to survey content, design, and dissemination. BC and RMC analysed the data. BC and JM interpreted the data. BC drafted and revised, and all authors agreed, the final manuscript version for submission.

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### **DATA SHARING STATEMENT**

Data are not publicly available for confidentiality reasons, however all data are reported.

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**FIGURE LEGENDS**

**Figure 1.** Composition (A) and size (B) of multi-professional teams delivering outpatient recovery and follow-up services

*Legend*

- A. Bar graph depicts number of outpatient services with various multi-professional team combinations. Detail of each corresponding profession is summarised in the table below. Total number of services = 130. Table E1 (Online Data Supplement) provides additional data on exact frequencies of occurrence of each combination. n (%) detailed by each profession reports the frequency of involvement of each profession across all 130 outpatient services. n=14 (10.8%) of 'Other' professions involved: Citizens Advice Bureau, n=4, Volunteers, n=2, Carers Association, n=2, Cognitive Behavioural Therapy, Rehabilitation Team, Advanced Critical Care Practitioner, Patient Liaison Service, Head Injury Specialist, Health Promotion Advisor, all n=1.
- B. Pie chart summarises the relative proportion of each team size (regardless of composition)

*Abbreviations:* PT = physiotherapist; OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner.

## TABLES

**Table 1.** Demographics of respondent hospitals

Characteristic	n (%)
Type of hospital	
District general	99 (56.3)
University teaching	63 (35.8)
Specialist centre	11 (6.3)
Other <sup>a</sup>	3 (1.7)
Profession of survey respondent	
Medic	79 (44.9)
Nurse	42 (23.9)
Physiotherapist	21 (11.9)
Other <sup>b</sup>	34 (19.3)
Critical Care service metrics	
Total critical care beds	3979
- Total ICU capability	2382
- Total HDU capability	1597
Estimated annual ICU admissions	116944
Type of critical care unit <sup>c</sup>	
General (mixed medical and surgical)	167 (94.9)
Trauma	52 (29.5)
Cardiothoracic	35 (19.9)
Neurological/Neurosurgery	34 (19.3)
Spinal	28 (15.9)

Liver	26 (14.8)
Burns	19 (10.8)
ECMO	9 (5.1)
Other <sup>d</sup>	37 (21.0)

*Abbreviations:* UK = United Kingdom; ICU = intensive care unit; HDU = high dependency unit; ECMO = extracorporeal membrane oxygenation

*Legend:* <sup>a</sup>Other includes: University-affiliated and Specialist combined, n=3. <sup>b</sup>Other includes: i) Profession not specified/reported, n=26 (e.g. Team Lead, Clinical Director, Ward Manager), ii) Various, n=5 (e.g. Clinical Educator, Audit lead), iii) Psychologist, n=2, iv) Dietitian, n=1. <sup>c</sup> Respondents could select more than one response therefore % exceeds 100%.

<sup>d</sup>Other denotes various specialties e.g. oncology, maxilla-facial, obstetrics, renal.

**Table 2.** Features of targeted inpatient recovery and follow-up services following critical illness

Feature	Options	n/127 (%)
Type of service provision <sup>a</sup>	Outreach/rapid response (patient outcomes)	71 (55.9)
	Engagement/education of ward staff re: post ICU issues	65 (51.2)
	Information provision	62 (48.8)
	Intensivist/AHP/nurse ward round	47 (37.0)
	Family support	36 (28.3)
	Psychological intervention	36 (28.3)
	Generic rehabilitation assistant/care coordinator	25 (19.7)
	Peer support	23 (18.1)
	Formal MDT meeting	17 (13.4)
	Research/academic contact	8 (6.35.4)
Other <sup>b</sup>	15 (11.8)	
Eligibility criteria	All patients	72 (56.7)
	Length of stay in critical care <sup>c</sup>	54 (42.5)
	Clinician/ward referral	37 (29.1)
	Days of mechanical ventilation <sup>d</sup>	31 (24.4)
	Type of therapies received during critical care admission	21 (16.5)
	Self-referral	14 (11.0)
	Diagnosis at critical care admission	11 (8.7)
	Other <sup>e, f</sup>	28 (19.0)
Professions involved in service delivery	Nurse	115 (90.6)
	Physiotherapist	70 (55.1)
	Intensivist	47 (37.0)
	Speech and Language Therapist	41 (32.3)

	Dietitian	39 (30.7)
	Occupational Therapist	27 (21.3)
	Pharmacist	27 (21.3)
	Generic rehabilitation assistant	19 (15.0)
	Psychologist	17 (13.4)
	Administrative support	13 (10.2)
	Social Worker	8 (6.3)
	Psychiatrist	5 (3.9)
	Other <sup>g</sup>	19 (15.0)
Key challenges to delivering and sustaining services	Staffing number	104 (81.9)
	Time	90 (70.9)
	Staffing profile	43 (33.9)
	Patient location	25 (19.7)
	Environment	21 (16.5)
	Funding	12 (9.4)
	Other <sup>h</sup>	14 (11.0)

Abbreviations: ICU = intensive care unit. MDT = multidisciplinary team. NHS = National Health Service

Legend: <sup>a</sup>99 sites reported outreach services for readmission prevention in addition to targeted recovery and follow-up services. <sup>b</sup>Other includes: Nurse review, n=6, Multiprofessional input, n=6, Patient support, n=2, Physiotherapy input, n=1. <sup>c</sup>>2 days, n=1, 3 days, n=6, >3 days, n=8, 4 days, n=1, >4 days, n=5, >7 days, n=3. <sup>d</sup>Any, n=1, 2 days, n=1, 3 days, n=2, >3 days, n=4, >4 days, n=5. <sup>e</sup>Other includes: Patient pathway, n=7, Delirium, n=7, Rehabilitation needs, n=5, Psychological status, n=3, Physical status, n=3, Age, n=2, Illness acuity level, n=1. <sup>f</sup>Patients receiving palliative care, or other specialist care/diagnosis-related pathways, and routine post-operative patients were generally not included in services. <sup>g</sup>Other includes: Outreach Team, n=14, Other rehabilitation/medical healthcare professionals, n=3, Advanced Critical Care Practitioner and Counsellor, both n=1. <sup>h</sup>Other includes: Staffing capacity, n=5, Lack of service prioritisation by management, n=3, Staff engagement with service, n=3, Staff recruitment, n=2, Links with primary care, Resources, and Appropriate service focus, all n=1.

**Table 3.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (/130, n, %)
Eligibility criteria	Clinician referral	60 (46.2)
	Self-referral	49 (37.7)
	Diagnosis	22 (16.9)
	Length of stay critical care <sup>a</sup>	18 (13.8)
	Days of mechanical ventilation <sup>b</sup>	17 (13.1)
	Therapies received	11 (8.5)
	All patients	8 (6.2)
	Other <sup>c</sup>	18 (13.8)
Process for identifying eligible patients	Triage of all critical care discharges	79 (60.8)
	Review of care records	52 (40.0)
	Local database	45 (34.6)
	Verbal clinician referral	37 (28.5)
	Automated IT process	19 (14.6)
	EPR request for clinic appointment	10 (7.7)
	Blanket invitation to all patients (no triage)	9 (6.9)
	Other <sup>d</sup>	2 (1.5)
Process of monitoring patients	Ad hoc patient list/spreadsheet	94 (72.3)
	Automated process	15 (11.5)
	Electronic patient record-generated list	13 (10.0)
	Other database	3 (2.3)



Method of patient contact regarding appointment	Postal letter	124 (95.4)
	Telephone call	88 (67.7)
	Text reminder	20 (15.4)
	Other <sup>e</sup>	10 (7.7)
Funding sources for outpatient services <sup>f</sup>	Funded internally from critical care funds	65 (50.0)
	National health service funding	38 (29.2)
	Volunteer/goodwill only	19 (14.6)
	Other internal institutional funding	7 (5.4)
Aspects of consultation	Review of ICU history and ICU events	123 (94.6)
	Patient visit to ICU	114 (87.7)
	Assessment of sleep	99 (76.2)
	Physical function assessment	96 (73.8)
	Return/review of ICU diary	94 (72.3)
	Physiotherapy referral	91 (70.0)
	Psychological assessment	86 (66.2)
	Clinical psychology referral	70 (53.8)
	Lifestyle/risk factor review	69 (53.1)
	Dietitian referral	67 (51.5)
	Speech and Language Therapy referral	60 (46.2)
	Family/caregiver needs assessment	54 (41.5)
	Review of goals and preferences of care	53 (40.8)
	Employment/occupation review	50 (38.5)
	Assessment of sexual function	49 (37.7)
	Occupational Therapy referral	47 (36.2)
	Nutritional assessment	47 (36.2)

	Pharmacy review/medicines reconciliation	46 (35.4)	
	Cognitive assessment	38 (29.2)	
	Vital signs/observations	33 (25.4)	
	Physical examination	33 (25.4)	
	Social needs assessment	33 (25.4)	
	Travel assessment (e.g. driving, flying)	31 (23.8)	
	Assessment of financial status	19 (14.6)	
	Occupational function assessment	13 (10.0)	
	Speech and language assessment	12 (9.2)	
	Psychiatric assessment	11 (8.5)	
	Immunisation review	10 (7.7)	
	GP referral/information	8 (6.2)	
	Other <sup>g</sup>	7 (5.4)	
Duration of appointment		New <sup>h</sup>	Follow-Up <sup>i</sup>
	<30 minutes	3 (2.3)	24 (18.5)
	30 minutes – 1 hour	67 (51.5)	61(46.9)
	1.0-1.5 hours	46 (35.4)	15 (11.5)
	1.5-2 hours	7 (5.4)	2 (1.5)
	2-2.5 hours	2 (1.5)	3 (2.3)
	2.5-3.0 hours	2 (1.5)	0
	>3 hours	2 (1.5)	0
Other	0	13 (10.0)	

Key challenges to delivering and sustaining services	Time	107 (82.3)
	Funding	95 (73.1)
	Personnel	71 (54.6)
	Space	67 (51.5)
	Perceived value or priority	52 (40.0)
	Managerial engagement	37 (28.5)
	Pressure from other services	27 (20.8)
	Staff engagement	15 (11.5)
	Other <sup>i</sup>	10 (7.7)

*Abbreviations:*

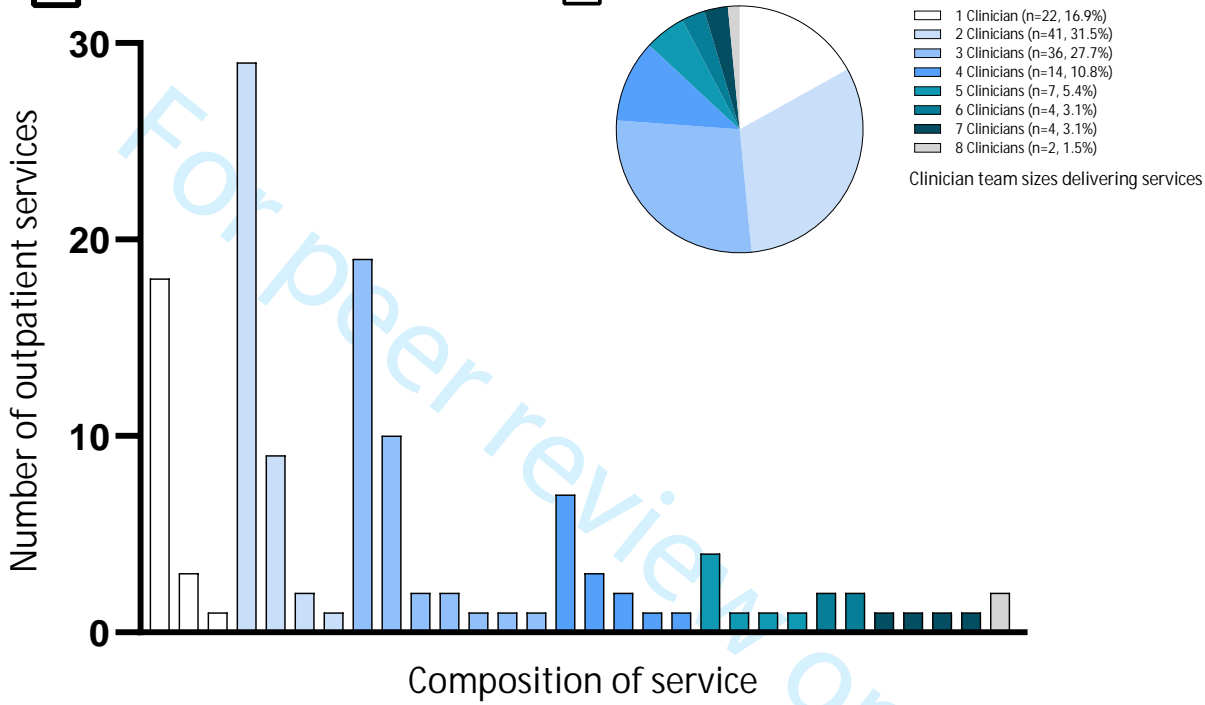
*Legend:* <sup>a</sup>≥2 days, n=6, ≥3 days, n=15, ≥4 days, n=6, ≥5 days, n=6, ≥7 days, n=4, >14 days, n=1. <sup>b</sup>>24 hours, n=1, ≥2 days, n=5, ≥3 days, n=12, ≥4 days, n=6, ≥5 days, n=7. <sup>c</sup>Other includes: Illness acuity, n=6, post intensive care syndrome, n=5, delirium, n=5, psychological problems, n=3, age, n=2, neurological impairment and locality, both n=1. Short length of stay (< 48 hours) and/or non-ventilated patients generally not deemed eligible for follow-up. <sup>d</sup>Other includes: Self-referral, n=1, via support group, n=1. <sup>e</sup>Other includes: Given appointment prior to hospital discharge, n=5, Email, n=4, Information leaflet, n=1. <sup>f</sup>n=1 missing response. Respondents (n=7) also commented that commissioned services for some patients e.g. trauma were available, that Outreach services and Charity support contributed some funding, and that some elements of some services were unfunded. <sup>g</sup>Other includes: General review, n=3, Signposting to local services, Referral to other specialties, Patient/relative feedback on service, Cardiac/respiratory/exercise referral, all n=1. <sup>h</sup>n=1 missing response. <sup>i</sup>Other includes: No subsequent follow-up appointment, n=10, No consistent follow-up appointment, n=2, Variable duration, n=1. <sup>j</sup>Other includes: None, n=2, Lack of administrative support and lack of referral pathways, n=2, Lack of community services, patient engagement, insufficient patient need, and current pandemic, all n=1.

**Table 4.** Themes characterising future plans for service development in next 2-5 years

Theme	Frequency of occurrence (/176) (n (%))
Expand current outpatient services	46 (26.1)
Start new outpatient service	40 (22.7)
Start new psychology service	23 (13.1)
Expand current inpatient services	23 (13.1)
Start new inpatient service	19 (10.8)
Start new exercise rehabilitation programme	13 (7.4)
Maintain current services	13 (7.4)
Establish new pathways with rehabilitation and specialist services	4 (2.3)
Nil specified	46 (26.7)

**A**

**B**



	n (%)
Nurse	121 (93.1)
Intensivist	100 (76.9)
DT	65 (50.0)
PT	14 (10.8)
Psychologist	36 (27.7)
Psychiatrist	3 (2.3)
SLT	9 (6.9)
GRA	1 (0.8)
Dietitian	11 (8.5)
Pharmacist	10 (7.7)
GP	1 (0.8)

	1 clinician	2 clinicians	3 clinicians	4 clinicians	5 clinicians	6	7 clinicians	8
Nurse	•	• •	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	•
Intensivist	•	•	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	•
DT		•	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	•
PT			•	•	•	•	•	•
Psychologist			•	•	•	•	•	•
Psychiatrist				•	•			•
SLT				•		•		•
GRA				•				
Dietitian				• •	•	•	• • • •	•
Pharmacist					•	•	• • • •	•
GP							•	

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## A UK wide survey of recovery and follow-up services following adult critical illness

### A UK wide survey of recovery and follow-up services following adult critical illness

**You are invited to participate in this cross-sectional survey to describe recovery and follow-up services available for adult critical care patients across the UK. We wish to collect information about services normally delivered at your organisation, and that were/are in place *prior* to the COVID-19 pandemic. There is opportunity to describe any changes in services as a result of the pandemic at the end of the survey.**

**Please read the accompanying Participant Information Sheet before progressing to complete this survey. This study has been approved by King's College London (MRA-19/20-17855), and completion of this survey implies your consent to participation.**

#### **Why is the survey being done?**

**The aims of the survey are:**

- 1. To evaluate the provision of recovery and follow-up services for adult critical care patients in line with NICE CG83 guidance**
- 2. To characterise these services in terms of location, content, format, structure, resource and funding**
- 3. To explore factors influencing availability of these services**

**This survey will be an update of an earlier published one (Connolly et al, BMJ Open, 2014, 4, e004963). For additional reference, please see the NICE CG83 'Rehabilitation After Critical Illness' Guidelines <https://www.nice.org.uk/Guidance/CG83>, and Quality Standards <https://www.nice.org.uk/guidance/QS158>.**

#### **What will the data be used for?**

**The findings will inform the Life After Critical Illness Workstream being undertaken by the Faculty of Intensive Care Medicine (Chair, Dr Carl Waldmann). Survey findings will be shared with the Faculty of Intensive Care Medicine for this purpose. Findings will also be disseminated in a peer-reviewed journal publication; these will be anonymous.**

**The overall goal of this work is to influence the development of robust, equitable, and well-resourced critical illness recovery and follow-up services across the UK.**

#### **How will the survey be done?**

**The survey should take approximately 30-45 minutes to complete, depending on the available services at your organisation; if you do not have any available services, completion time will be much quicker.**

**Questions will cover:**

- 1. Detail of your organisation and critical care services**
- 2. Provision of recovery and follow-up services on the ward following critical care discharge**
- 3. Provision of recovery and follow-up services after hospital discharge**

1  
2 **The survey questions are designed to collect information about all aspects of available follow-up**  
3 **services. We envisage that you will act as a principal responder/representative to coordinate the**  
4 **survey response at each organisation. You are encouraged to liaise with relevant multi-professional**  
5 **colleagues to provide full and accurate responses.**  
6  
7

8 **As the scope of services are known to be broad and diverse, completion of the free-text spaces for**  
9 **details not captured by the survey questions is encouraged.**  
10

11 **We would also like to potentially contact you in the future regarding the information you have**  
12 **provided in this survey (this is included in the consent to participate section). Do be sure to**  
13 **understand this section before submitting your full survey.**  
14  
15

16 **If you have any questions relating to the survey or its completion, please contact:**  
17  
18

19 **Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)**

20 **Dr. Joel Meyer (for the FICM, Joel.Meyer@gstt.nhs.uk)**  
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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 1: Lead Respondent Details

1. Name

2. Role/Job title

3. Place of Work

4. Email

5. Phone Number





## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 2: Adult Critical Care and Follow-Up Services at your institution

Please begin by telling us about your organisation and its adult critical care services.

\* 6. What is the name of your NHS Hospital?

\* 7. Type of hospital

- University-affiliated
- District general
- Specialist centre
- Other (please specify)

\* 8. Total number of Level 3 critical care beds

\* 9. Total number of Level 2 critical care beds

\* 10. Estimated annual Level 3 critical care admissions

\* 11. Please indicate all the specialist critical care services available at your hospital (Tick all that apply)

- |   |                                 |
|---|---------------------------------|
| <input type="checkbox"/> General (mixed)        | <input type="checkbox"/> Trauma |
| <input type="checkbox"/> Neurology/Neurosurgery | <input type="checkbox"/> ECMO   |
| <input type="checkbox"/> Cardiothoracic         | <input type="checkbox"/> Burns  |
| <input type="checkbox"/> Liver                  | <input type="checkbox"/> Spinal |
| <input type="checkbox"/> Other (please specify) |                                 |

1 \* 12. Many hospitals now offer recovery and follow up services for adult critically ill patients (separate to any  
2 defined specialty-specific pathways such as cardiac, trauma, or neuro- rehabilitation). For example:  
3

- 4 · *Inpatient/ward service*
- 5 · *Outpatient clinic*
- 6 · *Outpatient group programme*
- 7 · *Exercise/rehab class*
- 8 · *Peer support group*
- 9 · *Telephone/telehealth follow up*
- 10 · *MDT meeting independently of patient*
- 11 · *Web-based interface*
- 12 · *Postal survey*
- 13 · *Community-based*
- 14
- 15
- 16
- 17

18 Pre-COVID, if you normally DO offer any such recovery or follow up services at your hospitals please tick Yes  
19 and move on to the next question  
20

21 If you DO NOT offer such services please tick No and then progress to Section 3.

22  Yes

23  No

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28 If you answered Yes to Q12, please use sections 13-17 to tell us about each type of service that you offer; use a separate section for  
29 each component  
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13. Recovery/Follow Up Service 1

Name given to your service

Which of the following descriptors best describes this service?

- Inpatient/ward service*
- Outpatient clinic*
- Outpatient group programme*
- Exercise/rehab class*
- Peer support group*
- Telephone/telehealth follow up*
- MDT meeting independently of patient*
- Web-based interface*
- Postal survey*
- Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

- All critical care patients*
- A subset of patients only*
- Other (please specify)*

14. Recovery/Follow Up Service 2

Name given to your service

Which of the following descriptors best describes this service?

- Inpatient/ward service*
- Outpatient clinic*
- Outpatient group programme*
- Exercise/rehab class*
- Peer support group*
- Telephone/telehealth follow up*
- MDT meeting independently of patient*
- Web-based interface*
- Postal survey*
- Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

- All critical care patients*
- A subset of patients only*
- Other (please specify)*

1 15. Recovery/Follow Up Service 3

2 Name given to your  
3 service

4  
5 Which of the following  
6 descriptors best describes  
7 this service?

8 *Inpatient/ward service*

9 *Outpatient clinic*

10 *Outpatient group*

11 *programme*

12 *Exercise/rehab class*

13 *Peer support group*

14 *Telephone/telehealth follow*

15 *up*

16 *MDT meeting*

17 *independently of patient*

18 *Web-based interface*

19 *Postal survey*

20 *Community-based*

21 Which patients and which  
22 units does it include? (NB:  
23 Specific eligibility criteria  
24 covered later)

25 *All critical care patients*

26 *A subset of patients only*

27 *Other (please specify)*

30 16. Recovery/Follow Up Service 4

31 Name given to your  
32 service

33  
34 Which of the following  
35 descriptors best describes  
36 this service?

37 *Inpatient/ward service*

38 *Outpatient clinic*

39 *Outpatient group*

40 *programme*

41 *Exercise/rehab class*

42 *Peer support group*

43 *Telephone/telehealth follow*

44 *up*

45 *MDT meeting*

46 *independently of patient*

47 *Web-based interface*

48 *Postal survey*

49 *Community-based*

50  
51 Which patients and which  
52 units does it include? (NB:  
53 Specific eligibility criteria  
54 covered later)

55 *All critical care patients*

56 *A subset of patients only*

57 *Other (please specify)*

## 17. Recovery/Follow Up Service 5

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow*

*up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 3: Transferring from Critical Care to a Hospital Ward

\* 18. What is the process of discharge from critical care to hospital ward? (Tick all that apply)

Face to face handover

Telephone handover

Written handover

Other (please specify)

\* 19. What is included in the discharge process? (Tick all that apply)

Medical handover

Psychological/cognitive rehabilitation plan

Nursing handover

Nutritional plan

Medicines reconciliation

Occupational Therapy plan

Physical rehabilitation plan

Speech and Language therapy plan

Other (please specify)

\* 20. In what form is the critical care discharge summary provided to the ward team?

Paper

Digital

Both

\* 21. Is a critical care discharge summary sent to the General Practitioner at this stage?

Yes

No

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 4: Inpatient/Hospital Ward Services

We would now like to understand about inpatient/ward services for adult critically ill patients i.e. services applying to the period between critical care discharge and discharge from hospital.

\* 22. Do you provide inpatient follow-up services in the general wards after discharge from critical care?

Yes

No

If No, please state reasons why and then progress to Section 5

\* 23. For how long has this service been implemented?

0

Years

30



24. By what name is this service known? (If applicable)

1 \* 25. What form does this inpatient contact take? (Tick all that apply)

- 2  Outreach/rapid response (focussed on readmission prevention)
- 3  Peer support
- 4  Outreach/rapid response (focussed on outcomes)
- 5  Information provision
- 6  Generic rehabilitation assistant/care coordinator
- 7  Psychological intervention
- 8  Intensivist/AHP/nurse ward round
- 9  Research/academic contact
- 10  Formal MDT meeting
- 11  Engagement/education of ward staff about post ICU problems
- 12  Family support
- 13  Other (please specify)

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19 \* 26. What criteria are used to select patients for inpatient follow-up? (Tick all that apply)

- 20  All patients
- 21  Diagnosis at critical care admission
- 22  Length of stay critical care (if based on this, indicate number in Other section)
- 23  Self-referral
- 24  Clinician/ward referral
- 25  Days of mechanical ventilation (if based on this, indicate number in Other section)
- 26
- 27  Type of therapies received during critical care admission
- 28
- 29  Other (please specify)
- 30

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39 \* 27. Are any specific categories of patients excluded?

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43 \* 28. How are referrals for inpatient follow-up monitored?

- 44  Automated process
- 45  EPR generated list
- 46  Ad hoc patient list/spreadsheet
- 47  Other (please specify)
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1 \* 29. Which professions provide the inpatient service? (Tick all that apply)

- 2  Administrator  Pharmacist
- 3  Dietitian  Physiotherapist
- 4  Generic rehabilitation assistant  Psychiatrist
- 5  Intensivist  Psychologist
- 6  Nurse  Social Worker
- 7  Occupational Therapist  Speech and Language Therapist
- 8  Other (please specify)

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23 \* 30. What is the profession of the person who leads this inpatient service?

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29 \* 31. Is there any profession missing from the inpatient service that you would ideally include?

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\* 32. How is this inpatient follow-up service funded?

- NHS funding e.g. commissioned service or other sustained NHS funding route
- Grant funding – dedicated grant for this activity
- Funded internally from existing critical care funds
- Grant funding – allied to other ICU-related research studies
- Other internal institutional funding (specify in Other Section)
- Volunteer/goodwill only
- Other (please specify)

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\* 33. Do you use a screening tool for post intensive care issues?

- Yes
- No

If Yes please describe briefly

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1 \* 34. Describe the major challenges delivering and sustaining this inpatient service?  
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- 3  Time  
4  Staffing number  
5  Staffing profile  
6  Environment  
7  Patient location  
8  Other (please specify)  
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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 5: Outpatient Services following Hospital Discharge

We would now like to understand about outpatient services for adult critically ill patients i.e. services delivered following discharge from hospital.

\* 35. Do you provide follow-up services for adult critically ill patients following discharge from hospital?

Yes

No

If No please state reasons why and then progress to Section 6

\* 36. For how long has this service been implemented?

0

Years

30



37. By what name is this service known? (if applicable)

\* 38. How many 'new' patients attend per year (estimate)?

\* 39. How many 'follow-up' patients (i.e. subsequent visits) attend per year (estimate)?

\* 40. When does the follow-up first occur?

1 month after discharge from hospital

2-3 months after discharge from hospital

6 months after discharge from hospital

Other (please specify)

1 \* 41. What criteria are used to select patients for outpatient follow-up? (Tick all that apply)

- 2  All patients  Based on diagnosis
- 3
- 4  Length of stay critical care (if based on this, indicate number in  Self-referral
- 5 Other Section)  Clinician referral
- 6
- 7  Days of mechanical ventilation (if based on this, indicate
- 8 number in Other Section)
- 9
- 10  Based on therapies received
- 11
- 12  Other (please specify)

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20 \* 42. Are any specific categories of patients excluded?

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25 \* 43. How are eligible patients identified? (Tick all that apply)

- 26  Automated IT process generates the list  EPR request for clinic appointment
- 27
- 28  Review of care records  Blanket invitation (no triage)
- 29
- 30  Manual/active triage of all critical care discharges  Verbal clinician referral
- 31
- 32  Local database
- 33
- 34  Other (please specify)

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39 \* 44. Do you accept patients outside of your hospital or region to attend the service?

- 40  Yes
- 41
- 42  No
- 43
- 44  Additional Comments

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1 \* 45. How are patients tracked until their appointment?  
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- 4  Automated process  
5  EPR generated list  
6  Ad hoc patient list/spreadsheet  
7  Other (please specify)  
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12 \* 46. How are patients contacted/invited? (Tick all that apply)  
13

- 14  Telephone call  
15  Postal letter  
16  Given appointment prior to hospital discharge  
17  Text reminder  
18  Other (please specify)  
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23 \* 47. Which professions provide the outpatient service? (Tick all that apply)  
24  
25

- 26  Administrator  Pharmacist  
27  Dietitian  Physiotherapist  
28  Generic rehabilitation assistant  Psychiatrist  
29  GP  Psychologist  
30  Intensivist  Social Worker  
31  Nurse  Speech and Language Therapist  
32  Occupational Therapist  
33  Other (please specify)  
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39 \* 48. What is the profession of the person who leads this outpatient service?  
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45 \* 49. Is there any professions missing from the outpatient service that you would ideally include?  
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1 \* 50. How is this outpatient service funded?  
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- 4  NHS funding e.g. commissioned service or other sustained NHS funding route  
5  Funded internally from existing critical care funds  
6  Other internal institutional funding (specify in Other section)  
7  Grant funding – dedicated grant for this activity  
8  Grant funding – allied to other ICU-related research studies  
9  Volunteer/goodwill only  
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13 Other (please specify)  
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20 \* 51. What is the approximate tariff per patient [OR if tariffs not applicable to your region what is the  
21 approximate annual cost of running the outpatient service]?  
22

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26 \* 52. Where is the follow-up service located?  
27

- 28  Dedicated hospital outpatient area  
29  Adapted space within critical care  
30  Other area within the hospital  
31  Community site  
32  Other (please specify)  
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40 \* 53. How many clinic rooms are required to deliver the service? (Number and any other comments)  
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46 \* 54. If the patient is assessed by multiple healthcare professionals, do these encounters happen...  
47

- 48  Together (i.e. all healthcare professionals in the same room)  
49  Separately (i.e. healthcare professionals in different rooms)  
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1 \* 55. On average, what is the overall duration of a 'New' patient's appointment?  
2

- 3  <30 minutes  2 – 2.5 hours  
4  30 minutes – 1 hour  2.5 – 3 hours  
5  1 - 1.5 hours  >3 hours  
6  1.5 – 2 hours  
7  Other (please specify)  
8  
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14 \* 56. On average, what is the overall duration of a subsequent 'Follow up' patient's appointment?  
15

- 16  <30 minutes  2 – 2.5 hours  
17  30 minutes – 1 hour  2.5 – 3 hours  
18  1 - 1.5 hours  >3 hours  
19  1.5 – 2 hours  
20  Other (please specify)  
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28 \* 57. What is the maximum number of visits patients can have?  
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\* 58. What interventions are typically delivered in your outpatient follow-up service? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Physical function assessment                      | <input type="checkbox"/> Family/Caregiver needs assessment                 |
| <input type="checkbox"/> Physiotherapy referral if required                | <input type="checkbox"/> Employment/occupation review                      |
| <input type="checkbox"/> Cardiac/respiratory/exercise referral if required | <input type="checkbox"/> Assessment of financial status                    |
| <input type="checkbox"/> Occupational function assessment                  | <input type="checkbox"/> Social needs assessment                           |
| <input type="checkbox"/> Occupational Therapy referral if required         | <input type="checkbox"/> Review of goals and preferences of care           |
| <input type="checkbox"/> Psychiatric assessment                            | <input type="checkbox"/> Review of ICU history and ICU events with patient |
| <input type="checkbox"/> Psychological assessment                          | <input type="checkbox"/> Patient visit to ICU                              |
| <input type="checkbox"/> Clinical psychology referral if required          | <input type="checkbox"/> Return/review of ICU diary                        |
| <input type="checkbox"/> Cognitive assessment                              | <input type="checkbox"/> Assessment of sexual function                     |
| <input type="checkbox"/> Nutritional assessment                            | <input type="checkbox"/> Assessment of sleep                               |
| <input type="checkbox"/> Dietitian referral if required                    | <input type="checkbox"/> Travel assessment e.g. driving, airline flight    |
| <input type="checkbox"/> Speech and language assessment                    | <input type="checkbox"/> Vital signs/observations                          |
| <input type="checkbox"/> Speech and Language Therapy referral if required  | <input type="checkbox"/> Physical examination                              |
| <input type="checkbox"/> Pharmacy review                                   | <input type="checkbox"/> Immunisation review                               |
| <input type="checkbox"/> Lifestyle/risk factor review                      |  |
| <input type="checkbox"/> Other (please specify)                            |  |



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\* 59. For the following domains, please give the name of any validated outcome measure(s) or tool(s) used in your service, if any? Where able please explain why the measure has been chosen/implemented?

Anxiety	<input type="text"/>
Depression	<input type="text"/>
Post-traumatic stress disorder	<input type="text"/>
Sleep quality	<input type="text"/>
Sleep apnoea	<input type="text"/>
Cognition	<input type="text"/>
Health-related quality of life	<input type="text"/>
Personal Activities of Daily Living	<input type="text"/>
Pain	<input type="text"/>
Breathlessness	<input type="text"/>
Palliative care needs	<input type="text"/>
Sexual function	<input type="text"/>
Nutritional status	<input type="text"/>
Physical function	<input type="text"/>
Exercise capacity	<input type="text"/>
Disability	<input type="text"/>
Frailty	<input type="text"/>
Dependency	<input type="text"/>
Socioeconomic status	<input type="text"/>
Pharmacological risk	<input type="text"/>
Alcohol intake	<input type="text"/>
Smoking status	<input type="text"/>
Driving status	<input type="text"/>
Flying status	<input type="text"/>
Additional Comments	<input type="text"/>

1 \* 60. Do you use a screening tool for post intensive care issues?  
2  
3

4  Yes  
5

6  No

7 If Yes please describe briefly  
8  
9

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13 \* 61. Describe the major challenges delivering and sustaining this outpatient adult critical care recovery  
14 service?  
15

16  Time

Managerial engagement

17  Funding

Staff engagement

18  Personnel

Perceived value or priority

19  Space

Pressures from other services

20  Other (please specify)  
21  
22

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28 \* 62. To what extent do you agree that your current outpatient service meets the needs of your casemix?  
29

30  Strongly agree

31  Agree

32  Neither agree or disagree

33  Disagree

34  Strongly disagree  
35  
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40 \* 63. What is lacking to make it fully fit for purpose?  
41

42  Physical space

43  Increased personnel

44  Commissioned funding

45  Administrative support

46  Other (please specify)  
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\* 64. To what extent do you agree that your existing funding/venue/staff/resource/service model is sustainable over next 5 years?

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

\* 65. What would help with sustaining the service?

- Physical space
- Increased personnel
- Commissioned funding
- Administrative support
- Other (please specify)

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 6: Links and Future Plans - All Respondents

\* 66. Please tell us about any links or collaborations between your adult critical care service and recovery/follow-up services in neighbouring institutions (e.g. informal links for advice, formal hub and spoke network, established referral pathways etc)?

\* 67. Please tell us about any links you have established between your critical care services and the primary care interface or community interface?

\* 68. Please tell us about any links between your adult service and services for paediatric patients; adolescent patients; and those transitioning to adult services?

\* 69. Please tell us about any links with services for the care of the older person?

\* 70. What is being planned in your institution in terms of instigation, development, or expansion of adult critical care recovery services in the next 2-5 years?

1 \* 71. If you previously answered that you DO NOT offer any recovery and follow up services for adult critically ill  
2 patients within your Trust/institution, please could you give the main reasons for this? (Tick all that apply)

- 3  Lack of sufficient staff numbers  Insufficient patient numbers to justify
- 4  Lack of suitably trained staff  Not sure what to include in a service
- 5  Lack of available space/venue  Resources prioritised to other patient groups/clinical areas
- 6  No evidence to suggest benefit  Extra-contractual (out-of-area) patient caseload
- 7  Lack of funding  Not applicable - service are available
- 8  Not considered required service at managerial level
- 9  Other (please specify)

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20 \* 72. Do you have any web-based links / sites / information resources for recovering critical care patients and  
21 caregivers?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 7: Peer Support after Critical Illness

\* 73. Do you offer peer support services for adult critical care patients/relatives?

Yes

No

\* 74. What format does this peer support take?

Community or hospital-based support group meetings after discharge

Psychologist-led outpatient groups

Peer support based within ICU follow-up clinics

Online peer support

Groups based within the ICU

Peer mentor led

Other (please specify)

\* 75. How many times per year does this peer support occur?

\* 76. What is the average attendance of former patients?

\* 77. What is the average attendance of relatives/caregivers?

1 \* 78. What is the staffing input into these groups? (Tick all that apply)

- 2  None/peer-facilitated only
- 3
- 4  Critical care nurse
- 5
- 6  Intensivist
- 7
- 8  AHP
- 9
- 10  Psychologist
- 11  Other (please specify)
- 12

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16 \* 79. What is the format of the peer support session?

- 17
- 18  Structured agenda with talks/presentations
- 19
- 20  Therapy session
- 21
- 22  Facilitated discussion
- 23
- 24  Informal meeting
- 25
- 26  Drop in
- 27
- 28  Virtual
- 29  Other (please specify)
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34 \* 80. Is your peer support programme affiliated to any networks, for example ICU Steps or Society of Critical  
35 Care Medicine Thrive Initiative?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 8: Physical rehabilitation programmes after hospital discharge

\* 81. Do you provide a physical rehabilitation programme post hospital discharge specifically for post critical illness patients as part of *routine* clinical practice? (separate to generic services such as intermediate care, supported discharge, hospital-at-home or similar)

Yes

No

\* 82. Who is responsible for leading this rehabilitation programme? (Tick all that apply)

Exercise/sports Therapist

Occupational Therapist

Doctor

Physiotherapist

Nurse

Rehabilitation Medicine specialist

Other (please specify)

\* 83. Is this healthcare professional...

ICU specialist

Rehabilitation specialist



1 \* 84. How do you select patients for inclusion into the programme? (Tick all that apply, and give details of any  
 2 assessment measures if applicable in the comments section)

- 3  Duration of mechanical ventilation in ICU  Health-related quality of life at ICU discharge  
 4  Duration of ICU admission  Physical function at hospital discharge  
 5  Duration of hospital admission  Muscle strength at hospital discharge  
 6  Physical function at ICU discharge  Exercise capacity at hospital discharge  
 7  Muscle strength at ICU discharge  Health-related quality of life at hospital discharge  
 8  Exercise capacity at ICU discharge  Not applicable – all post critical care patients are eligible  
 9  Other (please specify)

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23 \* 85. Where does the patient receive the majority of the intervention?

- 24  Home-based  
 25  Hospital-based  
 26  Community-based  
 27  Other (please specify)

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36 \* 86. Do you use telehealth or other interactive forms of intervention delivery?

- 37  Yes  
 38  No

39 If YES, please give details

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50 \* 87. Does your rehabilitation programme include an exercise component?

- 51  Yes  
 52  No

## A UK wide survey of recovery and follow-up services following adult critical illness

\* 88. Do patients exercise:

- Under supervision
- Independently
- Combination
- Other (please specify)

\* 89. Do patients exercise in a:

- Pre-determined circuit
- Patient-specific plan
- Other (please specify)

\* 90. What exercises are included (Tick all that apply)?

- Cardiovascular e.g. step-ups, treadmill, bike
- Strength e.g. lower limb, upper limb, free weights
- Balance e.g. static, dynamic
- Functional e.g. sit-to-stand, walking
- Other (Please specify)

\* 91. How are these exercises prescribed? (Tick all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Results of walking tests                | <input type="checkbox"/> Target heart rate  |
| <input type="checkbox"/> Results of balance assessment           | <input type="checkbox"/> Target level of exertion e.g. Borg scale (please specify range in Other section) |
| <input type="checkbox"/> Results of physical function assessment | <input type="checkbox"/> Clinician judgement  |
| <input type="checkbox"/> Repetition maximum principle            |   |
| <input type="checkbox"/> Other (please specify)                  |   |

\* 92. How do you monitor and/or progress exercise intensity during the exercise session? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Heart rate targets                | <input type="checkbox"/> Clinical observation/judgement of patient |
| <input type="checkbox"/> SpO2                              | <input type="checkbox"/> Patient verbal feedback                   |
| <input type="checkbox"/> Level of exertion e.g. Borg scale | <input type="checkbox"/> No formal monitoring                      |
| <input type="checkbox"/> Visual analogue scale             | <input type="checkbox"/> Reassessment of baseline measures         |
| <input type="checkbox"/> Other (please specify)            |  |

\* 93. In your programme, do you use an accompanying rehabilitation or exercise manual?

- Yes
- No

\* 94. Is your programme:

A stand-alone programme  
for post critical illness  
patients

Part of existing  
rehabilitation services  
including patients with  
other disease groups, if so  
which

Other (please specify)

1 \* 95. At what time point post hospital discharge does the programme commence:

- 2  Immediately post hospital discharge  One month post hospital discharge
- 3  One week post hospital discharge  2-3 months post hospital discharge
- 4  Two weeks post hospital discharge
- 5  Other (please specify)

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\* 96. Does your service have a waiting list?

- Yes
- No

If Yes, how long?

\* 97. Does your service have sufficient capacity to meet demand?

- Yes
- No

\* 98. How many sessions are in the rehabilitation programme?

\* 99. How often are the sessions?

- Weekly
- Twice-weekly
- Fortnightly
- Other (please specify)

\* 100. How long is each session?

- 30 minutes
- 45 minutes
- 1 hour
- Other (please specify)

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\* 101. Is this a:

- Rolling programme
- Stand alone

Additional Comments

\* 102. How many patients are in the group?

\* 103. What is the staff:patient ratio?

\* 104. Does your physical rehabilitation programme include an education component?

- Yes
- No



A UK wide survey of recovery and follow-up services following adult critical illness

\* 105. What topics are included (and list which MDT members delivers them)

Exercise	<input type="text"/>
Stress management	<input type="text"/>
Nutrition	<input type="text"/>
Return to work	<input type="text"/>
Energy conservation	<input type="text"/>
Medications	<input type="text"/>
What to expect of recovery	<input type="text"/>
Motivational coaching/training	<input type="text"/>
Other (please specify)	<input type="text"/>

\* 106. What outcome measures do you use with patients participating in your rehabilitation programme?

Please specify detail...

Strength-based e.g. repetition maximum	<input type="text"/>
Exercise capacity e.g. field walking tests (e.g. 6 Minute Walk Test, cardiopulmonary exercise testing (VO2max)	<input type="text"/>
Health-related quality of life e.g. SF-36 survey, Hospital Anxiety and Depression scale	<input type="text"/>
Mental/cognitive assessment e.g. Montreal Cognitive Assessment	<input type="text"/>
Functional performance e.g. Timed Up and Go, Short Physical Performance Battery	<input type="text"/>
Other (please specify)	<input type="text"/>

1 \* 107. Do you refer ICU patients routinely into other rehabilitation programmes/services, either in-patient or  
2 community-based?  
3

4  Yes

5  No  
6  
7

8 \* 108. If YES.... which type? (Tick all that apply)  
9

10  Pulmonary rehabilitation

11  Cardiac rehabilitation

12  Exercise on prescription (or similar)

13  Community gym sessions

14  Other (please specify)  
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22 109. Any other comments regarding your post critical illness physical rehabilitation programme?  
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## A UK wide survey of recovery and follow-up services following adult critical illness

\* 110. Please indicate the barriers to delivering a post hospital discharge physical rehabilitation programme (Tick all that apply)

- |   |   |
|---|---|
| <input type="checkbox"/> Lack of funding  | <input type="checkbox"/> Extracontractual (out of area) patient caseload              |
| <input type="checkbox"/> Lack of sufficient staff                                     | <input type="checkbox"/> Lack of trained staff  |
| <input type="checkbox"/> Resources prioritised to other patient groups/clinical areas | <input type="checkbox"/> No evidence to demonstrate rationale/requirement for service |
| <input type="checkbox"/> Not considered required service at managerial level          | <input type="checkbox"/> Not sure what content to include in a programme              |
| <input type="checkbox"/> Lack of available space                                      | <input type="checkbox"/> Time constraints   |
| <input type="checkbox"/> Insufficient patient numbers to justify                      |   |
| <input type="checkbox"/> Other (please specify)                                       |   |

111. From the list above, please indicate the MAIN barrier that applies





A UK wide survey of recovery and follow-up services following adult critical illness

Impact of COVID-19 on recovery and follow-up services following critical illness

\* 112. Please tell us of any changes to existing services, if applicable, or development of any new services, as a result of COVID-19; for example in relation to timing, structure, format, and content, of delivery, the number of healthcare professionals involved etc



## A UK wide survey of recovery and follow-up services following adult critical illness

### End of survey

Thank you for completing this survey and once again if you have any questions relating to the survey or its completion, please contact:

Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)

Dr. Joel Meyer (Joel.Meyer@gstt.nhs.uk)

1  
2  
3 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
4 **survey and progress report**  
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8

9 **Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams, Ceri Battle, Jo McPeake, Tara Quasim,**  
10 **Jon Silversides, Andrew Slack<sup>5</sup>, Carl Waldmann, Elizabeth Wilson, Joel Meyer<sup>5</sup> on behalf of the**  
11 **Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
12  
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16 **ONLINE DATA SUPPLEMENT**  
17  
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19 **E1. Survey**  
20

21 A copy of the survey is enclosed.  
22  
23

24 **E2. Discharge process from critical care to hospital ward**  
25

26 The discharge process for patients transferring from critical care to the hospital ward is a written  
27 handover in 90.9% (n=160) of institutions, commonly accompanied by telephone (n=120, 68.2%) or  
28 face-to-face (n=118, 67.0%) handover. Domains contained within the handover document include  
29 nursing (n=174, 98.9%), medical (n=167, 94.9%), physical rehabilitation (n=145, 82.4%), nutritional  
30 management (n=141, 80.1%), medicines' reconciliation (n=121, 68.8%), and speech and language  
31 therapy plan (n=102, 58.0). In the majority of cases (n=157, 89.2%) respondents reported using more  
32 than one delivery process for patients, with either paper (n=79, 44.9%), digital (n=35, 19.9%), or both  
33 (n=62, 35.2%) forms of delivery used. Less frequently reported components of handover included  
34 psychology/cognitive rehabilitation (n=49, n=27.8%) and occupational therapy (n=44, 25.0%). Other  
35 reported content (n=11, 6.3%) included outreach liaison, social work, and any specific individual  
36 aspects of care. A critical care discharge summary is sent to patients' primary care physician in 74  
37 (42.0%) of institutions.  
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### E3. Inpatient recovery and follow-up services

Of 127 targeted inpatient recovery and follow-up services, the majority of cases were led by nursing staff (n=65, 51.2%, n=4 missing responses), with just over one quarter led by the multi-professional team (n=36, 28.3%), and a small proportion by medics (n=16, 12.6%). Physiotherapists (n=3) and rehabilitation co-ordinators (n=1) were reported in a minority of cases (both  $\leq 3.0\%$ ).

The most frequently reported professions missing from inpatient services were psychology (n=55, 43.3%), occupational therapy (n=29, 22.8%), and physical therapy (n=18, 14.2%). Other missing professions were reported as follows: Medical (n=11, 8.7%), speech and language therapy (n=11, 8.7%), dietetics (n=10, 7.9%), and in a minority of cases, nursing, psychiatry, rehabilitation assistants, social workers, pharmacists, cognitive behavioural therapy, occupation health, advanced critical care practitioners, and administrators (all  $\leq n=5$ ,  $\leq 4.0\%$ ). Eleven and 2 respondents respectively reported the whole multi-professional team, and 'All allied health professionals' as missing from services. Twenty-three respondents (18.1%) reported that there were no professions missing from their services.

#### E4. Outpatient recovery and follow-up services

One hundred and thirty respondents (/176, 73.9%) reported providing outpatient (following hospital discharge) recovery and follow-up services for adult post critical illness patients. Additional reasons for excluding patients from services (all  $n \leq 3$  respondents) included: cardiothoracic/cardiology diagnoses, neurological diagnoses, dementia/cognitive impairment, diagnosis of an overdose, requiring home mechanical ventilation, residing out of geographical hospital area, discharged to a residential or nursing home, other specialist rehabilitation pathway in place, prisoners, elective surgery, aged >75 years, previous non-attendance. Whilst intensivist and nursing staff were the most frequently reported staff leading services, a small number of other professions/teams were detailed by respondents: joint intensivist and nurse ( $n=7$ ), multi-professional team ( $n=4$ ), joint intensivist and psychologist ( $n=2$ ), and physiotherapist, joint advanced critical care practitioner and physiotherapist, surgeon, joint intensivist and physiotherapist, and joint nurse and physiotherapist (all  $n=1$ ).

The majority ( $n=108/130$ , 83.1%) of services involved 2 or more healthcare professions, with further breakdown according to number of healthcare professions involved; 1, ( $n=22$ ), 2 ( $n=41$ ), 3, ( $n=36$ ), 4 ( $n=14$ ), 5 ( $n=7$ ), 6 ( $n=4$ ), 7 ( $n=4$ ), 8 ( $n=2$ ). Combinations of healthcare professions providing services are reported in Table E1. The most frequently reported professions missing from outpatient services were psychology ( $n=61$ , 46.9%), physiotherapy ( $n=45$ , 34.6%), occupational therapy ( $n=41$ , 31.5%), and dietetics and speech and language therapy (both  $n=22$ , 16.9%). Less frequently reported missing professions included intensive care medicine and pharmacy (both  $n=11$ , 8.5%), social work ( $n=7$ , 5.4%). A minority of respondents reported psychiatry, administrative support, nursing, the multi-professional team, rehabilitation team, primary care physician, pain team, occupational health, counsellor, wellbeing services, and service improvement team, as professions missing from outpatient services (all  $n \leq 4$ ,  $\leq 3.1\%$ ). Clinic rooms available for services typically ranged 1-4. Subsequent appointments, after the initial one, typically ranged between 1 and 3, but some respondents reported no limits on the number of repeat visits patients could have.

Seventy-six respondents (58.5%) reported using some form of screening tool for post intensive care issues; specifically named tools were not always provided but where they were these included the Chelsea Critical Care Physical Assessment Tool, Intensive Care Psychological Assessment Tool, Hospital Anxiety and Depression Scale, Post-Traumatic Stress Symptoms-14 scale, Short-Form 36. Where specific tools were not listed respondents reported use of their own locally developed proformas and concerns checklists, and rating scales (e.g. distress thermometer), and/or indicated the broad domains they assessed e.g. activities of daily living, psychological status. Eight-five respondents gave examples

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3 of outcome measures or tools to assess aspects of critical illness recovery, which are summarised in  
4 Table E2.  
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8 Twelve (9.2%) respondents indicated they strongly agreed their current outpatient service met the  
9 needs of their local case-mix, 56 (43.1%) were in agreement, 21 (16.2%) neither agreed or disagreed,  
10 34 (26.2%) were in disagreement, and 7 (5.4%) in strong disagreement. When asked whether existing  
11 service models (including funding, venue, staffing, resources) were sustainable for the next 5 years, 9  
12 (6.9%) reported they strongly agreed, 46 (35.4%) agreed, 32 (24.6%) neither agreed or disagreed, 36  
13 (27.7%) disagreed, and 7 (5.4%) strongly disagreed. Increased personnel (n=103, 79.2%),  
14 commissioned funding (n=89, 68.5%), administrative support (n=74, 56.9%), and physical space for  
15 the service (n=56, 43.1%) were factors required to support services.  
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23 Additional factors reported to help sustain services over the next 5 years included better referral  
24 pathways, clear standards to guide services, greater medical engagement, enhanced links with  
25 primary care services, and improved profile of the service (all individually reported by one  
26 respondent).  
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**Table E1.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (n/130, %)
Timeframe for first follow-up	2-3 months after hospital discharge 6 months after hospital discharge 1 month after hospital discharge Other <sup>a</sup>	102 (78.5) 8 (6.2) 6 (4.6) 13 (10.0)
Number and combination of professions of clinicians involved <sup>b</sup>	1 clinician - Nurse - Intensivist - Physiotherapist  2 clinicians - Nurse, Intensivist - Nurse, Physiotherapist - Intensivist, Physiotherapist - Intensivist, OT  3 clinicians - Nurse, Intensivist, Physiotherapist - Nurse, Intensivist, Psychologist - Nurse, Intensivist, OT - Intensivist, Physiotherapist, Psychologist - Nurse, Intensivist, Psychiatrist - Nurse, Physiotherapist, SLT - Nurse, Intensivist, GRA  4 clinicians - Nurse, Intensivist, Physiotherapist, Psychologist - Nurse, Intensivist, Physiotherapist, OT - Nurse, Intensivist, Physiotherapist, Dietitian - Nurse, Physiotherapist, Psychologist, Dietitian - Nurse, Intensivist, Physiotherapist, Psychiatrist  5 clinicians - Nurse, Intensivist, Physiotherapist, Psychologist, Pharmacist - Nurse, Intensivist, Physiotherapist, OT, SLT - Nurse, Intensivist, Physiotherapist, SLT, Dietitian - Nurse, Intensivist, Physiotherapist, OT, Psychologist  6 clinicians - Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT - Nurse, Intensivist, Physiotherapist, Psychologist, Dietitian, Pharmacist  7 clinicians	22 (16.9) - 18 - 3 - 1  41 (31.5) - 29 - 9 - 2 - 1  36 (27.7) - 19 - 10 - 2 - 2 - 1 - 1 - 1  14 (10.8) - 7 - 3 - 2 - 1 - 1  7 (5.4) - 4 - 1 - 1 - 1  4 (3.1) - 2 - 2  4 (3.1)

	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT, Dietitian,	- 1
	- Nurse, Intensivist, Physiotherapist, Psychologist, SLT, Dietitian, Pharmacist	- 1
	- Nurse, Intensivist, Physiotherapist, Psychologist, SLT, Dietitian, GP	- 1
	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT, Pharmacist	- 1
	8 clinicians	2 (1.5)
	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, Psychiatrist, Dietitian, Pharmacist	- 2
Location of service delivery	Dedicated hospital outpatient area	83 (63.8)
	Adapted space within critical care	26 (20.0)
	Other area within the hospital	11 (8.5)
	Community site	6 (4.6)
	Other <sup>c</sup>	3 (2.3)
Format of assessment by multiple clinicians <sup>d</sup>	Together (i.e. all clinicians in the same room)	77 (59.2)
	Separately (i.e. clinicians in different rooms)	42 (32.3)

*Abbreviations:* OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner

*Legend:* <sup>a</sup>Other includes: 2 weeks, n=3, 2-4 weeks, n=1, 6 weeks, n=2, 3 months, n=1, 3-6 months, n=4, 4-5 months, n=1, 6-12, n=1. <sup>b</sup>Administrative support counted separately; 29 (22.3%) sites reported administrative support for outpatient service.

<sup>c</sup>Other includes: Multiple areas for service deliver, n=2, Other clinical outpatient area, n=1 (n=1 blank response). <sup>d</sup>n=11 missing responses.



**Table E2.** Examples of outcome measures or tools to assess aspects of post critical illness recovery in outpatient services

Impairment	Examples of outcome measures/tools
Anxiety	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Generalised Anxiety Disorder Assessment; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Short Form-36
Depression	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Patient Health Questionnaire-9; Major ICD-10 Depression Inventory; Perceived Stress Questionnaire;
Post-traumatic stress disorder	Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; Trauma Screening Questionnaire; EuroQol-5Dimension; Impact of Events Scale-Revised; Primary Care Post Traumatic Stress Disorder Screen;
Sleep quality	Insomnia Severity Index; Pain and Sleep Questionnaire
Sleep apnoea	STOP-Bang Questionnaire
Cognition	Montreal Cognitive Assessment; Mini-Mental State Examination; 4AT test; Confusion Assessment Method for the ICU; Addenbrooke's Cognitive Examination-Revised;
Health-related quality of life	Short Form-36; EuroQol-5Dimension; Schwartz Outcomes Scale-10
Personal activities of daily living	Barthel Index; Self-efficacy Tool; Short Form-36
Pain	Verbal/numeric 0-10 rating scale; Brief Pain Inventory; Critical Care Pain Observation Tool;
Breathlessness	Borg scale; Modified Medical Research Council scale; RAND breathlessness scale; pulmonary function tests; chest x-ray
Palliative care needs	RAND Mental Health Inventory
Sexual function	Sexual Health Questionnaire
Nutritional status	Weight
Physical function	Functional Independence Measure + Functional Assessment Measure; Rivermead Mobility Index; ICU Mobility Scale; Barthel Index; Chelsea Critical Care Physical Assessment Tool; Physical Function in ICU Test; Handgrip dynamometry; Six Minute Walk Test; Berg Balance Scale; Sit-to-Stand test; Short-Form 36; EuroQol-5Dimension
Exercise capacity	Six Minute Walk Test; Borg scale; EuroQol-5Dimension; Chelsea Critical Care Physical Assessment Tool; Tinetti test; Metabolic equivalents
Disability	Chelsea Critical Care Physical Assessment Tool; EuroQol-5Dimension

Frailty	Rockwood Clinical Frailty Scale; Clinical Frailty Scale; EuroQol-5Dimension
Dependency	EuroQol-5Dimension; Post-Traumatic Stress Symptoms-14 scale
Socioeconomic status	EuroQol-5Dimension
Pharmacological risk	-
Alcohol intake	Unit-based calculation
Smoking status	Pack year history
Driving status	Referral to a local driving centre; reference to DVLA (Driver and Vehicle Licensing Agency) guidelines
Flying status	Reference to British Thoracic Society (UK) guidelines
Additional comments	<i>A number of respondents reported no use of specific tools, but thorough clinical assessment +/- use of a 'concerns checklist', or 'distress thermometer', to identify and rate problems.</i>

### E5. Links between recovery and follow-up services and other services

Forty-three respondents (/176, 24.4%) reported no links between their recovery and follow-up services and any neighbouring institutions, networks, or other referral pathways.

Remaining respondents (133/176, 75.6%) reported examples of links between their own services, and other similar services in neighbouring institutions, summarised into 8 categories: i) informal links into critical care networks including knowledge and best practice sharing (n=67, 38.1%), ii) linking to community service pathways e.g. pulmonary rehabilitation, psychology (n=27, 15.3%), iii) informal referrals made to neighbouring centres (n=20, 11.4%), iv) coordination with other specialty clinics e.g. respiratory, trauma, neurosciences (n=19, 10.8%), v) formal referrals made to neighbouring centres (n=10, 6.0%), vi) peer support referral (n=9, 5.1%), vii) formal referrals accepted from neighbouring centres (n=8, 4.5%), and viii) informal referrals accepted from neighbouring centres (n=6, 3.4%).

Examples given by respondents where links were present (87/176, 49.4%) between their recovery/follow-up services and primary care and/or community interfaces, were summarised into 8 categories: i) referral to community therapy services (n=27, 15.3%), ii) patient letter sent routinely to primary care physician (n=26, 14.8%), iii) ad hoc contact with primary care physician (n=16, 9.1%), iv) post critical illness information provided to primary care physician (n=15, 8.5%), v) signposting to community citizens advice and employment services support (n=11, 6.3%), vi) referral to community independent exercise programmes (n=9, 5.1%), vii) referral to community independent psychology services (n=8, 4.5%), viii) support for residential ventilation care (n=2, 1.1%). Eighty-nine respondents (50.6%) indicated that there were no links available with primary/community care sectors.

Around three-quarters of respondents indicated no links between their (adult) recovery/follow-up services and services managing paediatric, adolescent, or transition-to-adult (n=135, 76.7%), or with services for care of older adults (n=131, 74.4%). For the former, a small number of respondents (n=24, 13.6%) reported ad hoc links with paediatric services, and a minority (n=7, 4.0%) reported available links with transition-to-adult services. For the latter, a small number of respondents (n=23, 13.1%) indicated some ad hoc links with services during the inpatient stage of recovery, and a minority indicated links with community services (n=10, 5.7%) and older person psychiatric service (n=3, 1.7%).

**E6. Peer support after critical illness**

Additional forms of peer support offered included: composite involving multiple options of delivery, visits from former patients, and a peer-mentor led group (all reported by one respondent each). Furthermore one respondent indicated their service was currently under active development, and detail was not reported by one respondent.

Three services were peer-facilitated only, and one other service involved former patients and families. Other staffing was reported very infrequently (ranging 1-3 occasions); chaplaincy, critical care outreach staff, counselling staff, advanced critical care practitioners, social work, pharmacy, administrative staff, and ICU volunteers.

## E7. Post hospital discharge physical rehabilitation programmes

Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26, 83.9%), or in combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or rehabilitation assistant (all n=1, 3.2%, each). One programme was led by an exercise/sports therapist. Clinicians leading programmes were either ICU-specialist (n=19, 61.3%) or rehabilitation-specialist (n=12, 38.7%). Physical rehabilitation programmes were primarily hospital-based (n=22, 71.0%), with some community-based (n=5, 16.1%), home-based (n=2, 6.5%), and combination (home and community, n=2, 6.5%) delivery. Telehealth (or other interactive forms of intervention delivery) was used by only one respondent. Three-quarters of programmes were stand-alone (n=23, 74.2%), but a small number of respondents reported programmes were integrated with other disease-specific rehabilitation services n=5, 16.1%). Eighteen programmes (58.1%) were rolling programmes i.e. patients could enter the programme at any point, as opposed to part of a discrete cohort. Programmes were generally well serviced with no waiting list (n=23, 74.2%) and capacity to meet need (n=23, 74.2%). Further features of physical rehabilitation programmes are summarised in Table E3.

All but one programme included an exercise component (n=30, 96.8%), albeit no further responses were provided by one respondent to detail their programme further. For the remaining respondents (n=29), features of the exercise component of their physical rehabilitation programme are reported in Table E4. Barriers to the delivery of post hospital discharge physical rehabilitation programmes are summarised in Table E5. Lack of funding was both the most frequently reported barrier (n=128, 72.7%) as well as the main barrier reported (n=86, 48.9%). Lack of sufficient staff was the second most frequent (n=116, 65.9%), and main (n=28, 15.9%), barrier.

**Table E3.** Features of physical rehabilitation programmes

Feature	Options	Occurrence (/31, (n, %))
Timepoint post hospital discharge that programme commences*	Immediately post hospital discharge	8 (25.8)
	2-3 months post hospital discharge	7 (22.6)
	Other – individualised per patient	5 (16.1)
	1 month post hospital discharge	3 (9.7)
	4-6 weeks post hospital discharge	2 (6.5)
	2 weeks post hospital discharge	2 (6.5)
Assessment criteria for patient inclusion~	Duration of ICU admission	22 (71.0)
	Duration of mechanical ventilation during ICU	17 (54.8)
	Physical function at ICU discharge	9 (29.0)
	Muscle strength at ICU discharge	9 (29.0)
	Exercise capacity at ICU discharge	9 (29.0)
	Physical function at hospital discharge	7 (22.6)
	Duration of hospital admission	5 (16.1)
	Muscle strength at hospital discharge	5 (16.1)
	Health-related quality of life at ICU discharge	4 (12.9)
	Exercise capacity at hospital discharge	4 (12.9)
Session details <sup>a</sup>	Weekly	20 (64.5)
	Twice-weekly	3 (9.7)
	Individualised per patient	3 (9.7)
	Fortnightly	2 (6.5)
	<i>Number of sessions (median (IQR))</i>	6 (5.5-9.0)
Duration of sessions <sup>a</sup>	1 hour	15 (48.4)
	30 minutes	6 (19.4)
	Individualised	5 (16.1)
	45 minutes	2 (6.5)
Number of patients attending a session ( <i>open-ended question</i> )	Responses variable, ranging from individual patients (if a home-based programme or 1:1 format), to up to 20 in a group. Examples reported include 4-8, 6-8, average 6, up to 12, 8-10, 8-15	-
Staff: patient ratio ( <i>open-ended question</i> )	Responses variable; examples include 1:1, 1:3, 1:4, 1:5-6, 2:8, 2:6, 2:12; staff could be qualified or a combination of qualified and assistant	-
Education topics, and members of the MDT involved <sup>b</sup>	Yes	22 (71.0)
	No	6 (19.4)
	Exercise	18 (58.1)
	- PT, Nurse, Medic, PTA	17 (54.8)
	Recovery expectations	17 (54.8)

	<ul style="list-style-type: none"> <li>- PT, Nurse, MDT, Medic</li> </ul> Energy conservation	16 (51.6)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA, OT, Independent</li> </ul> Nutrition	13 (41.9)
	<ul style="list-style-type: none"> <li>- PT, DT, Nurse, Medic, MDT</li> </ul> Return to work	12 (38.7)
	<ul style="list-style-type: none"> <li>- PT, Medic, Nurse, OT, Vocational Specialist</li> </ul> Medications	11 (35.5)
	<ul style="list-style-type: none"> <li>- Medic, Nurse, PT, Pharmacist</li> </ul> Motivational training	11 (35.5)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA</li> </ul> Stress management	9 (29.0)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, OT, Medic</li> </ul> Other e.g. falls management, breathing control, mindfulness, individualised needs, goal-setting	5 (16.1)
Use of outcomes and examples of outcome measures <sup>c</sup>	Strength assessment	14 (45.2)
	<ul style="list-style-type: none"> <li>- Quadriceps strength, handgrip strength, repetition count, CPAX</li> </ul> Exercise capacity	17 (54.8)
	<ul style="list-style-type: none"> <li>- Walking tests (6MWT, ISWT), Timed Up and Go, CPEX</li> </ul> Health-related quality of life	18 (58.1)
	<ul style="list-style-type: none"> <li>- HADS, EQ-5D, SF-36</li> </ul> Cognitive/Mental health	2 (6.5)
	<ul style="list-style-type: none"> <li>- Readiness for return to work</li> </ul> Function	7 (22.6)
Onwards referral to other rehabilitation programmes <sup>d</sup>	Yes	20 (64.5)
	No	7 (22.6)
	Pulmonary rehabilitation	16 (51.6)
	Cardiac rehabilitation	15 (48.4)
	Community gym session	14 (45.2)
	Exercise on prescription (or similar community exercise/walking programme)	6 (19.4)

**Abbreviations:** ICU = intensive care unit; PT = physiotherapist; PTA = physiotherapy assistant; OT = occupational therapist; DT = dietitian; MDT = multidisciplinary team; CPAX = Chelsea Critical Care Physical Assessment Tool; 6MWT = Six Minute Walk Test; ISWT = Incremental Shuttle Walk Test; CPEX = cardiopulmonary exercise test; HADS = Hospital Anxiety and Depression Scale; EQ-5D = Euroqol-5 Dimension; SF-36 = Short-Form 36; NEADL = Nottingham Extended Activities of Daily Living; SPPB = Short Physical Performance Battery.

**Legend:** Respondents could choose more than one option from multiple response-option questions. \*Two respondents reported uncertainty on time-frame for programme commencement, one respondent reported it commenced after attendance at local follow-up programme, and one respondent did not report. ~Four respondents reported aspects of individual patient assessment by clinicians for appropriateness, and may be dependent on underlying diagnosis and/or ongoing rehabilitation requirements. One respondent reported inclusion was based on assessment after attendance at local follow-up programme. One respondent expanded on the use of the Chelsea Physical Assessment Tool and the Intensive Care Psychological Assessment Tool as assessment measures for applicable criteria. <sup>a</sup>Three non-responses. <sup>b</sup>Eleven non-responses. <sup>c</sup>Seven non-responses. <sup>d</sup>Four non-responses.

**Table E4.** Features of exercise components of physical rehabilitation programmes

Feature	Options	Occurrence (/29, (n, %))
Approach to patient exercise	Under supervision	15 (51.7)
	Independently	2 (6.9)
	Combination of aforementioned	11 (37.9)
	Dependent on individual patient	1 (3.4)
Design of exercise component	Patient-specific plan	17 (58.6)
	Pre-determined circuit	10 (34.5)
	Combination of aforementioned	2 (6.9)
Type of exercise included*	Strength	28 (96.6)
	Functional	26 (89.7)
	Cardiovascular	25 (86.2)
	Balance	23 (79.3)
Approach to exercise prescription~	Clinician judgement	23 (79.3)
	Results of physical function assessment	17 (58.6)
	Target level of exertion	13 (44.8)
	Results of walking tests	11 (37.9)
	Results of balance assessment	7 (24.1)
	Repetition maximum principle	4 (13.8)
Approach to exercise monitoring and progression#	Clinical observation of patient	20 (69.0)
	Patient verbal feedback	20 (69.0)
	Level of exertion	17 (58.6)
	Oxygen saturation level	10 (34.5)
	Reassessment of baseline measures	10 (34.5)
	Heart rate targets	9 (31.0)
	Visual analogue scale	2 (6.9)
	No formal monitoring	1 (3.4)
Accompanying rehabilitation or exercise manual	Yes	15 (51.7)
	No	14 (48.3)

*Abbreviations:* ICU = intensive care unit

*Legend:* \*Strength exercise e.g. lower limb, upper limb, free weights; Functional exercise e.g. sit-to-stand, walking; Cardiovascular exercise e.g. step-up, treadmill, cycling; Balance exercise e.g. static, dynamic; 2 respondents reported also including work-based movement pattern exercise. ~In addition to the response options, one respondent also indicated use of a local graded exercise system incorporating 3 levels at each exercise station depending on individual patient ability. #3 respondents reported uncertainty as to detail of approach.



**Table E5.** Barriers to the delivery of post hospital discharge physical rehabilitation programmes

Barrier	Occurrence overall (n/176, %)	Occurrence as main barrier (n, %)
Lack of funding	128 (72.7)	86 (48.9)
Lack of sufficient staff	116 (65.9)	28 (15.9)
Resources prioritised to other patient groups/clinical areas	82 (46.6)	8 (4.5)
Not considered required service at managerial level	70 (39.8)	12 (6.8)
Lack of available space	70 (39.8)	4 (2.3)
Time constraints	49 (27.8)	5 (2.8)
Lack of trained staff	34 (19.3)	1 (0.6)
Not sure what content to include in a programme	30 (17.0)	0
No evidence to demonstrate rationale/requirement for service	25 (14.2)	3 (1.7)
Extracontractual (out of area) patient caseload	18 (10.2)	1 (0.6)
Insufficient patient numbers to justify	13 (7.4)	2 (1.1)
Other*	13 (7.4)	11 (6.3)

Missing responses, n=23 (overall), n=43 (main).

*Legend:* \*Other (overall) = Lack of patient motivation, n=3; no staff willing/motivated to run service, n=3; never considered as a service previously, n=2; significantly large rural catchment area of hospital, n=1; lack of patient facilities e.g. transport, parking, n=1; local referral pathways to physiotherapy services already in place, n=1; rehabilitation the responsibility of the admitting clinical specialty, n=1; onset of the COVID-19 pandemic, n=1. Other (main) = no staff willing/motivated to run service, n=3; non-commissioned service, n=1; no time to develop service, n=1; lack of patient motivation, n=1; onset of the COVID-19 pandemic, n=1; patient moved from acute setting, n=1; patient heterogeneity limiting standardised service, n=1; other rehabilitation service available to refer into, n=1; no single main barrier (all options apply), n=1.

### E8. Impact of COVID-19 on recovery and follow-up services following critical illness

Summative content analysis<sup>1</sup> was used to review and identify themes from respondents' free text responses detailing the impact of the COVID-19 pandemic on their services e.g. any changes to existing services, if applicable, or the development of any new services. Table E6 presents the themes generated, and the frequency with which they featured across all responses. Table E7 reports the narrative free text responses with accompanying thematic coding.

**Table E6.** Themes describing changes to services as an impact of COVID-19 pandemic

Theme	Letter denoting theme	Frequency of occurrence (/162) (n, %)
No change to service	a	17 (10.5)
Applying for funds/new service as an impetus/response	b	44 (27.2)
Research about follow-up initiated	c	1 (0.6)
New service implemented: telephone based	d	14 (8.6)
New service implemented: face to face	e	16 (9.9)
New service implemented: virtual	f	12 (7.4)
New service implemented: exercise	g	15 (9.3)
Increased capacity/activity of existing service	h	40 (24.7)
Decreased capacity/activity of existing service	i	48 (29.6)
Increased frequency of existing service	j	20 (12.3)
Existing service conversion to telephone	k	30 (18.5)
Existing service conversion to virtual	l	44 (27.2)
Shortened review interval compared to previous	m	11 (6.8)
Addition of psychologist to service	n	6 (3.7)
Follow-up combined with respiratory medicine services	o	20 (12.3)

**Table E7.** Narrative free text responses with accompanying thematic coding (with reference to Table E6)

Free text response*	Themes
We have performed telephone triage of all patients within a week of discharge and have then provided an MDT zoom clinic, each patient assessed for 30 mins with further follow up phone calls/ongoing referrals made (all patients have ongoing needs and will receive further follow up, our patient support group is virtual, we have started an exercise class and now have links to an exercise class run by the respiratory team for pulmonary fibrosis). We still have no psychologist though have funding for this service#	d, g, l, n, o
Business case being rewritten	b
Our Follow Up team had been pulled to work clinically on ITU during Covid 19. Currently one member now back to doing follow up. Limited in hospital follow up has occurred due to infection risk in different ward locations. Outpatient clinic follow up being done virtually using video technology#	i, l
More frequent follow up clinics, more exercises based reviews for discharge. We would love some psychology input	g, h, j, n
Currently the rehab role is 18.5hrs for the clinical nurse specialist, this is being increased 37.5 for 8 weeks due to increased patient numbers. No other services hours have been increased	h
Currently have an intensivist running clinic and doing more patient assessments and tests. Running 5 physio rehab classes a week on line with support group. Post ICU ward visits taking much longer. Telephone consultations have increased	g, h, j
Follow-up service is now online	l
Awaiting response to business case for dedicated follow up funding	b
Services have been delayed as needed to work clinically. We are looking at trying to get funding to provide rehab sessions post discharge.	b, i
No outpatients since start of covid, now setting up video conference for non covid patients and outpatient appointments for covid patients with further physical examination and other clinician input.	i, l
Plans for physical rehabilitation programme whilst inpatient and following discharge, trying to obtain psychology input, formal payment from commissioners for follow up clinic	b, g, n
With COVID there is a much greater demand for all of these services. We are including all COVID level 2 and 3 patients on our post ICU pathway (including those having CPAP in non ICU areas), and ICU follow up clinic, we are only in the early stages of working out how we are going to deal with the increased work load. The patients are all receiving an earlier psychol review and cognitive assessment as an inpatient, and once at home an initial in depth 1:1 virtual rehab assessment with them and then will be invited to a virtual exercise class (increased to twice weekly from the usual once weekly) , with a link to access exercise videos in their own time. We have separated off the psychological and physical aspects of clinic - the former is done first, then the latter. There will need to be more sessions for ICU clinic. We are also linking in with the respiratory consultants, so as not to be duplicating workload as a result of their COVID BTS guidelines. This will all require increased resources, we are unsure where this will come from currently	b, g, h, l, m, o
Our therapists have visited each of our Covid admissions at home as part of a research study that we have devised and gained approval for. We also held a follow up Covid clinic with a respiratory physician, a physio and an OT.	c, e, o
Telephone contact not face to face	d
Use of online platforms for follow up, communication with relatives and discharged patients	l
Telephone follow up to discharged patients	k
Just setting up a multidisciplinary follow up clinic for covid patients and trying to expand that to all patients but not commissioned yet... Using modified pickups tool for screening	b
Covid-19 essentially stalled all non-pandemic business and delayed implementation. The loss of SPA time negatively impacted planning.	b, i

1	During COVID 19 the clinic was point on hold. Due to lockdown and the senior sister required to	i, l
2	work clinically. Since the lockdown the clinic has now been undertaken via telephone	
3	consultation. We have increased the service to two nurses to help "catch up"	
4		
5	This will have to be a "telephonic" clinic and I am not sure how effective it will be. The numbers	b, i, k
6	will be overwhelming and I am not sure as we have not yet commenced clinics at our hospital.	
7		
8	Face to face follow up clinic now telephone based Delay in getting x2 Rehabilitation therapy	i, l
9	assistant practitioners interviewed in March 2020 into post, Delay in being able to set up post	
10	ICU Support groups	
11	Have submitted business case for proper follow up service	b
12	Increased clinic as we have a white worker calling patients from home	h, k
13	Step down rehabilitation ward created and patients received a lot of input from allied health	h, j, m
14	professionals to reduce length of stay. Increased hours for Follow Up clinic	
15	Physio involvement. Difficulty delivering Follow-up clinics	h, i
16	Not received OT funding. Availability of working at home. Clinic & rehab class now online.	b, g, i, l
17	Increased info available online. Timing delayed as Follow up role during pandemic paused as	
18	helping on unit.	
19		
20	Usually 3 critical care follow-up nurses and 0.3 physiotherapist in follow-up (physiotherapy only	e, h
21	reviewed ward based patients needing assistance of 2 or more to transfer) - nil involvement in	
22	outpatient follow-up. During COVID physiotherapy now 1.0 equivalent - partaking in	
23	telecommunications with patients and MDT follow-up clinic. MDT follow up clinic due to be	
24	trialled this week (Consultant, nurse, physiotherapy, OT, SLT, dietician)	
25	New joint clinic with respiratory team for COVID ICU pts	e, h, o
26	Permanent loss of gym. Restrictions on group exercise. Limited staffing. Limited suitable	i
27	patients	
28	No	a
29	Impetus to develop follow-up services for critical care	b
30	We have established a 6 week MDT to discuss patients after phone contact. Full MDT attendance	d, h
31	(physio, nurses, OT, psychology, dietitian, SLT, medic). All good will with no funding	
32	Implemented Nurse led follow up for all COVID-19 patients and general critical care patients	d, f, h
33	who have been on critical care for 4 days or longer	
34	Phone triage for follow up clinic	k
35	Outpatient clinics have been done via telephone rather than face to face. We haven't yet been	b, k
36	able to secure support to run the clinic via a virtual medium - although we are hoping to run	
37	clinics this way soon	
38		
39	We have set up a COVID follow up service alongside the respiratory physicians. This involves a	b, d, e, h,
40	phone clinic to all patients admitted to hospital with COVID and those with ongoing resp needs	m, o
41	only are then seen face to face by resp alone, those with multimorbidity and post ITU issues are	
42	seen in an MDT. The MDT comprises of Critical care physician, respiratory physician, critical care	
43	physio, critical care OT, SLT, Specialist nurses for critical care and psychology. The clinic runs	
44	fortnightly and we see 6 patients face to face. The patients have lung function done on arrival.	
45	They are in clinic for 2.5-3 hours. The aim is a one stop assessment and they are referred onto	
46	other services such as musculoskeletal physio, dysfunctional breathing clinic, outpatient	
47	cognitive rehab etc. This is funded in part by emergency funds at the moment and a significant	
48	amount of goodwill. It will stop once the COVID patients are seen but we are hoping to use the	
49	information gained from this to set up a fully fledged critical care follow up service <sup>#</sup>	
50	All clinic activity halted other than phone calls	d, i
51	Our class is now running virtually with weekly phone calls, booklets and exercises sent to	g, k, l
52	patient, videos emailed of exercise. Follow up is now just telephone but looking to being able	
53	to meet patients face to face again	
54	No	a
55	Due to COVID for first few weeks the service was suspended. But then started via phone call.	i, k, l
56	Currently Follow up clinic is up and running virtually.	
57	Inpatient round initially paused, restarted a few months ago. Follow up clinics now virtual, either	i, k, l
58	via video or telephone. Timescale to follow up potentially longer due to back log.	
59	Telephone follow up. Email	k
60		

1		
2		
3		
4	Current loss of outpatient service and exercise programme. Unable to allow patients to visit critical care post-discharge. Using teleconference for ICU Steps meetings. Using more telephone consultations.	i, l
5		
6	Separate fully funded MDT follow up clinic for Covid including those through ICU. Continue with inpatient ward round reviews, now also supported by a Physio. Clinic review now in virtual format, phone or attend anywhere	b, l
7		
8		
9		
10	The staff load was much higher, so the Rehabilitation After Critical Illness pathway was sometimes not followed up. We had to move to phone calls only review.	i, k
11	Rehabilitation After Critical Illness consultant and Coordinator had meeting with Mental Health consultant but decided to continue link already established as numbers very small	a
12		
13	No follow-up clinics	a
14	Business case approved so now working on developing service for the Trust	b
15	No new services	a
16	Covid have stopped all our services, but i have restarted ward based follow up visits	i
17	We are running the same service but at the moment the follow up clinic is being run via video link	l
18		
19	Support group currently suspended - telephone calls made ad hoc to patients needing support. Priority given to acute patients on outreach service - however post discharge to ward patients still reviewed <sup>#</sup>	d, i
20		
21	Outpatient clinic cancelled for three months - now via telephone, video Increased managerial interest in post covid problems	i, k, l
22		
23	This has made the management think this may be important. This has led to some management cooperation with setting up a future service and a post covid service now. However we have to fund from within our dept. This may change. Clinical director now working with the ICU medical director to develop local covid rehab. It is still being shaped as a service by people with no expertise in the topic. A box will be ticked but it won't be great.	b
24		
25	None so far	a
26	Service under development anyway. Has highlighted need for service to senior management	b
27	Some consultant and nursing staff went to local acute trust to help out for 3 months	i
28	Plan on having virtual clinics Aim to see bereaved relatives who did not get the chance to visit	i, l
29	Will be referred to pulmonary rehab service. Increase in staff in that service. Will not be COVID specific	i
30	No more resources or funding but many more patients and relatives	i
31	Virtual follow-up clinic now running Increased frequency to weekly rather than bi-weekly (for 3 month period) to meet patient demand Virtual or telephone physiotherapy rehabilitation Developing electronic notes for all MDT <sup>#</sup>	h, j, m
32		
33	As staff were redeployed then an 2-3x weekly inpatient review was provided on the wards for all ICU survivors, but physio, physio assistant (and ICU nurse at one site). A post-COVID rehabilitation group has been set up at (second site) for ICU Survivors once home, with aim to roll out across the trust imminently, Increased clinic capacity provided for time limited period to be able to offer ICU Follow Up clinic to all ICU COVID Survivors <sup>#</sup>	g, h, j, m
34		
35	Adapted to remote delivery - now weekly 1 hour group - 30 mins physio + Q+A + 'guest speakers' + mindfulness <sup>#</sup>	l
36		
37	Dedicated therapy team to ICU during pandemic with a view to make this permanent. Combined COVID clinics with respiratory team/consultant. Further highlighting need for OT. Respiratory consultant has attended Group support meetings are now via zoom	b, f, h, o
38		
39	Trialing of telephone follow up - very time consuming; unable to follow through patients with current staffing levels <sup>#</sup>	i, k
40		
41	Reduced in hospital follow up due to staffing pressures.	i
42	All services paused during the peak of the pandemic. Since then the service has doubled each month to see the increased number of discharges that require rehab follow up	h, j
43		
44	We have secured funding for a post Covid 19 follow up clinic. This resource can only deliver services to a small number of patients. Patients initially receive a phone-call screening. If required they can be seen in a follow up clinic (either remotely or face-to-face). This clinic is run by Medics, Nursing, Physio, OT and Psychology (one of each).	b, e, f
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1	Trialling a clinic model for covid patients	b, h
2	Virtual pathway set up on discharge - 12/52 pulmonary rehab pathway run by gym techs	f, g, h
3	No face to face reviews difficulty progressing with launch of rehab service instead of existing follow up clinic	b, h
4	Have developed a follow-up service specifically for COVID patients	e
5	We delayed the follow up clinic during the pandemic period and we are not having to reinstate it. - ITU consultants are also seeing all the covid patients as we expect to see a lot of PTSD.	i
6	Difficult question to answer as our hospital was shut due to COVID outbreak. All admissions were diverted to surrounding hospitals. At time of writing we are only just starting to reopen	A
7	Fewer available healthcare professionals due to sickness or shielding	i
8	Now telephone clinic	k
9	Limited peer support	i
10	All assessments and follow up appointments have been done via either telephone or video call. No face to face appointments within the physio clinic as yet. Consultant follow up at 3/12 is now face to face as an option. Rehab group not currently running with lots of barriers to work round before it can run again. Patients are sent home exercise programme to complete with support and guidance remotely. Hoping to try a virtual class if ongoing delay to physical class being restarted. A positive has been greater joint working with Dieticians and due to the increased numbers, as the Physio now undertake the initial nutrition screen if they aren't routinely following up. will then refer to them if needed. Definitely greater MDT working with them.	g, k, l
11	We had MDT staff all working together	h
12	Sadly follow up was temporary halted due to clinical need, now back up and running. Sudden interest in COVID patients and their rehab needs but it is all ICU patients that need it.	i
13	Video and teleconferencing to patients	f
14	2 weeks post-discharge telephone follow up in addition to the usual 2-3 months post discharge follow up clinic, virtual clinics (so far telephone only)	d, j
15	Improved follow-up from ICU Therapists from ICU to ward. Improved connections with specialist rehab services. Unable to offer gym 1:1 follow-up rehab.	b, h
16	Face to face clinics now on a virtual platform; peer support meeting to go on Zoom virtual platform. Forced reduction of follow up service for non-covid patients. In-patient rehab support and information for covid patients but now discontinued due to staff returning to clinical areas. Support from the Rehabilitation clinical team for non-ventilated ICU covid patients i.e. had NIV only	i, l
17	Not critical care linked but follow up outpatient appointments for COVID patients within the respiratory department, linked with a clinical psychologist. Cards sent to critical care patients post COVID offering them to get in touch/ meet with members of staff to discuss their ICU stay	e, n, o
18	Daily physio input to covid patients as part of outreach team as 6 week pilot. Referral pathway to clinical psychologist via outreach Letter to patient's home explaining ICU journey Extended outreach on the ward including family support Telephone screening of problems prior to follow up clinic Transition from face-to-face to telephone clinic <sup>#</sup>	d, h, k
19	Our service has been put on hold temporarily due to staffing constraints	i
20	Critical care rehab team changed referral criteria to pick up all patients from ICU with Covid-19. Covid-19 rehab guide produced for inpatient and to continue once discharged. Covid-19 MDT in community is being developed. Follow Up clinic has stopped due to lockdown and acute caseload. Not yet restarted but patients highlighted are being called by Intensivist.	i, k
21	Increased number of clinics and expansion of personnel	h, j
22	MDT approach and referrals pathway	h
23	Increased ITU beds, Increased number of clinics More professionals involved. Video consultation intensive care follow up clinics <sup>#</sup>	h, j, l
24	A new Covid19 follow up clinic has been set up combined with respiratory team.	b, e, o
25	Psychology support for patients and relatives	b, h
26	Routine video clinic for most patients (with option of face-to-face review if required). Sooner first review (4 weeks rather than 8-12 weeks)	l, m
27	Initially clinic paused therefore generated waiting list. Criteria remains > 3 days on critical care. Have introduced telephoning screening system, inclusive of locally designed symptom screening questions, PHQ2, GAD2, and trauma screening questionnaire to identify patients who need MDT	i, k, l



review in follow-up clinic. If patients score > 3 on screen, > 3 on PHQ2 or GAD2, or >6 on TSQ they are invited to clinic. This screening is completed by a nurse, occupational therapist or physiotherapist. Patients who have ongoing symptoms are invited to clinic, they can attend via teleconference, face-to-face or virtually via attend anywhere. Our clinic team now includes an occupational therapist, based on temporarily agreed funding.	
Remote clinic	l
Expansion by 46 beds Recruitment of 15 consultants, 30 trainees, and ~200 nurses <sup>#</sup>	a
COVID follow up. Video conferencing clinic appointments, patients can no longer be taken back to the ITU - setting up virtual reality tours. No diaries kept during COVID - looking into virtual diaries. More interest in MDT follow up.	h, l
Considering doing outpatient follow up clinic virtually - allocated team reaching into ICU and following patients up on ward -physio led virtual clinics for all critical care patients - all post covid patients discharged from hospital, will be seen in a virtual physio led clinic	b, f
Additional clinics and more physiotherapy services	h, j
Review of services - COVID evidence/guidance as instigated review of critical care unit follow up services	b
There are plans for a follow up service	b
Increased from x2/month to x2/week. Face to face to video/telephone consultation with Respiratory physicians doing face to face clinic with investigations of heart and lungs in hospital. We focused on holistic, cognitive and psychosocial aspects. Funded via Covid block payment <sup>#</sup>	h, j, l, o
All initial assessments done over telephone, but greater input earlier in discharge process. MDT input from respiratory team	j, k, o
Increased use of phone and video call follow up	k, l
Follow up service currently on hold, although many patients have been written to and sent an ICU Steps booklet. These patients will be followed up virtually In due course. New build planned with expanded number of beds, and then re-purposing of existing beds for respiratory beds and level 1.5 beds	i, l
Nil	a
Delayed as still significant covid demand. All clinics have been cancelled & telephone clinics have been set up but hindered by lack of resources & information	j, k
Face to face clinics suspended. Support groups suspended. Home visits carried out as per government guidelines maintaining social distance at all times	i
Not aware	a
The patient support group has not been running due to social distancing and members of the public not being able to attend the hospital. The Critical care Outreach team implementation has been delayed. (it is a new service)	b, i
We have had funding for 2 rehab techs to follow pts from ITU to the ward and then home to give physical support. This funding was secured prior to Covid but has the staff have started this month so in line with Covid.	b, e
We have seen our COVID patients at 2-3 weeks post discharge instead of 2-3 months and have instigated a rehab course for them in conjunction with pulmonary rehab team <sup>#</sup>	j, l, m, o
We started the first follow up clinic last week virtually. We plan on continuing with the virtual clinics <sup>#</sup>	l
We have gone to virtual clinics. The numbers are high. It pushed the follow up agenda. During the COVID-19 response the unit now has 2 clinics that it contributes to, developed from a need to provide critical care input alongside respiratory for follow-up of all ventilated COVID-19 patients as part of the British Thoracic Society's follow-up recommendations. One clinic is led by one consultant (dual Intensive Care Medicine/Respiratory) that follows up all patients at 12 weeks (or thereabouts) in terms of physical/cognitive/psychological symptoms, and co-ordinating any on-going need for investigation/management. This clinic runs on one or two afternoons a week dependent on clinical availability of that consultant, and only started in July. It is a face to face clinic, and several screening questionnaires are used as part of the appointment. The other clinic that has been created out of the COVID-19 response is a virtual multi-disciplinary clinic (hosted on Attend Anywhere) involving consultant intensivist, psychologist and physiotherapist. They each have a half hour slot with the patient for their assessment. It runs once a week, and three consultants contribute to it. It includes all health	a, b, e, f, h, l, o

board patients that have been ventilated on the unit for 72 hours or longer. It was initially established in July as well, as a way of attempting to deliver the 6 week virtual COVID follow-up as per the BTS recommendations, but also follows up non-COVID patients <sup>#</sup>	
Psychology now directly involved (previously ICU consultant would screen and refer as needed which incurred some delay) and attend each clinic visit along with the ICU consultant Clinics suspended for 3 months due to Covid activity and escalated rotas. Unable/unwise to bring patients to hospital during lockdown so virtual clinic format set up. Due to service reconfiguration, the area formerly used for ICU clinic is unavailable, so virtual clinic will continue for the foreseeable future. Virtual format works reasonably well but it limits our ability to bring patients into the physical space of the ICU environment which many patients found very useful. We have replaced this with sharing pictures and videos over Zoom which is good but not ideal. We have found in the virtual format we have less contact with family members. In a face-to-face clinic a family member would usually attend with them and we were able to give them some support and debrief too. Patients seem less likely to involve family members on video call for some reason	b, i, l, n
New pilot service established for COVID patients - combination of virtual and face to face. Intensivist/physio/psychology team and hope to get an exercise program delivered virtually <sup>#</sup>	b, e, f, g
n/a	a
Face to face abandoned during Covid surge. Now reinstated but backlog of cases so some telephone triage occurring. Patients currently attending later after discharge than previously	i, k
We will need to do virtual clinics and lose the peer support but we will aim to bring back face to face clinics asap	i, l
Along with another hospital in the health board, we have applied for funding for a post covid follow up clinic	b
n/a	a
Nil	a
Timing, use of virtual clinic, videoconferencing. Work starting for respiratory follow up for all COVID patients admitted to level 2 or level 3 May have a one stop clinic involving many specialties specifically for COVID patients which is (organisation) wide. Still all in pipeline. Otherwise clinics will be virtual rather than meeting with limited peer support	b, l, o
No changes at present	a
Unable to offer class format so at planning level re moving forward. Phone call check-ins are commencing. Virtual appointments have been discussed but concerns re; funding and staff availability. Time consuming processes so trying to factor that in.	i, k
Cancellation of face to face reviews/ exercise classes. Move to telephone assessments in first phase. Then videoconferencing if deemed useful. Likely to result in significant reduction in what can be offered.	i, k
Testing delivery virtually via telephone and Near Me	k, l
Programme now virtual/online	l
Formal follow-up not been continued- currently on hold. Support given to bereaved families with psychology support. Letters/phone call follow up	i
No new staffing but more formalised ICU follow-up service and screening being planned with relevance to what we already do and what we could do more in a joined up fashion. All covid positive pneumonia patients have been triages and follow-up as deemed necessary within existing pulmonary rehab services.	b, h, o
During COVID the Critical Care Outreach Team were redeployed to other posts and the service was disbanded temporarily.	i
New Post ICU follow up service now partially funded	b, e, f
We have just received funding to set service up	b
1. New bi-weekly MDT initially for COVID patients but thus far has extended, at least for now, to include non-COVID patients. 2. "Tailored Talks" as discussed earlier. Novel personalised information provision support service. 3. Chest, Heart and Stroke nursing support through telephone follow up post hospital discharge, as previously mentioned	d, h, j, o
Nil	a



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Unable to deliver current group model. We have started to try and deliver a virtual programme to individuals using near me consultations and assessments. We are also considering delivering presentations remotely via videoconferencing links.	i, l
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	Massive impact on ability to deliver ward based follow up. Patients no longer attending hospital for follow up clinic. Now exploring the use of technology for virtual follow up clinic. Using a lot more telephone consultations. However, this has given us an opportunity to rethink how we do things and as a consequence we are developing a more joined up service using the MDT.	b, k, l
	There has been no changes to our service. In fact this service was cut for the first 4 weeks of the pandemic to allow staff to be pulled to deliver direct patient care.	i
	We had disruption of our service due to Covid	i
	Hospital wide Post-COVID discharge follow up service. We are also developing a post Critical Care follow up service for post-COVID patients.	b, h

\*Responses reported verbatim with the exception of edits made to ensure no identifiable detail. #Indicates a response that applied to more than one individual hospital within an overarching healthcare organisation.

Abbreviations: MDT = multidisciplinary team; ICU/ITU = intensive care/therapy unit; OT = occupational therapy; SLT = speech and language therapy.

## References

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**CHERRIES Checklist****Enhanced provision of critical illness recovery and follow-up services: a national survey and progress report**

**Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams<sup>5</sup>, Ceri Battle<sup>6</sup>, Joanne McPeake<sup>7, 8, 9</sup>, Tara Quasim<sup>7, 8</sup>, Jon Silversides<sup>10</sup>, Andrew Slack<sup>11</sup>, Carl Waldmann<sup>12</sup>, Elizabeth Wilson<sup>13</sup>, Joel Meyer<sup>11</sup> on behalf of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group**

Item category	Checklist item	Page number
Design	Describe survey design	7
IRB (Institutional Review Board) approval and informed consent process	IRB approval	8
	Informed consent	8
	Data protection	8
Development and pre-testing	Development and testing	7
Recruitment process and description of the sample having access to the questionnaire	Open survey versus closed survey	8
	Contact mode	8
	Advertising the survey	8
Survey administration	Web/E-mail	8
	Context	N/A
	Mandatory/voluntary	N/A
	Incentives	N/A
	Time/Date	8
	Randomisation of items of questionnaires	7
	Adaptive questioning	7
	Number of items	Online Supplement
	Number of screens (pages)	Online Supplement
	Completeness check	8
	Review step	Online Supplement
Response rates	Unique site visitor	N/A

	View rate (Ratio of unique survey visitors/unique site visitors)	N/A
	Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	9
	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	9
Preventing multiple entries from the same individual	Cookies used	N/A
	IP check	N/A
	Log file analysis	N/A
	Registration	7
Analysis	Handling of incomplete questionnaires	8-9
	Questionnaires submitted with an atypical timestamp	N/A
	Statistical correction	8-9

# BMJ Open

## Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national cross-sectional survey and progress report

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Keywords:	Adult intensive & critical care < ANAESTHETICS, Adult intensive & critical care < INTENSIVE & CRITICAL CARE, REHABILITATION MEDICINE

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3 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
4 **cross-sectional survey and progress report**  
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9 **Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams<sup>5</sup>, Ceri Battle<sup>6</sup>, Joanne McPeake<sup>7, 8, 9</sup>, Tara**  
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11 **behalf of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
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**Online Data Supplement**

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## ABSTRACT

### Objective

To comprehensively update and survey the current provision of recovery, rehabilitation, and follow-up services for adult critical care patients across the UK.

### Design

Cross-sectional, self-administered, predominantly closed-question, electronic, online survey.

### Setting

Institutions providing adult critical care services identified from national databases.

### Participants

Multi-professional critical care clinicians delivering services at each site.

### Results

Responses from 176 UK hospital sites were included (/242, 72.7%, 95%CI 66.8 to 78.0%). Inpatient recovery and follow-up services were present at 127 (/176, 72.2%) sites, adopting multiple formats of delivery and primarily delivered by nurses (n=115/127, 90.6%). Outpatient services ran at 130 sites (73.9%), predominantly as outpatient clinics. Most services (n=108/130, 83.1%) were co-delivered by 2 or more healthcare professionals, typically nurse/ICU physician (n=29/130, 22.3%) or nurse/ICU physician /physiotherapist (n=19/130, 14.6%) teams. Clinical psychology was most frequently lacking from inpatient or outpatient services. Lack of funding was consistently the primary barrier to service provision, with other barriers including logistical and service prioritisation factors indicating that infrastructure and profile for services remains inadequate. Post hospital discharge physical rehabilitation programmes were relatively few (n=31/176, 17.6%), but peer support services were available in nearly half of responding institutions (n=85/176, 48.3%). The effects of the COVID-19 pandemic resulted in either increasing, decreasing, or reformatting service provision. Future plans for long-term service transformation focus on expansion of current, and establishment of new, outpatient services.

### Conclusion



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3 Overall, these data demonstrate a proliferation of recovery, follow-up, and rehabilitation services for  
4 critically ill adults in the past decade across the UK, albeit service gaps remain suggesting further work  
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6 is required for guideline implementation. Findings can be used to enhance survivorship for critically  
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8 ill adults, inform policy-makers and commissioners, and provide comparative data and experiential  
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10 insights for clinicians designing models of care in international healthcare jurisdictions.  
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**Word Count**

292

**Keywords**

Critical illness; recovery; follow-up; services; rehabilitation; survey, peer support

## ARTICLE SUMMARY

### STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the largest and most comprehensive survey of post critical illness recovery, rehabilitation, and follow-up services available across the UK
- This survey builds on previous work by examining additional stages of the survivorship continuum, as well as a greater range of services
- Our response rate achieved a representative sample of target sites, which were identified from established national registries, and with multi-professional clinicians providing data
- Limited data on non-responders precludes comparison with responders to detect response bias
- Acquiring one survey response per site, regardless of number, size, or specialty of ICUs at that site may have limited detection of bespoke differences in local service delivery

## INTRODUCTION

Survivorship following critical illness is characterised by varied, long-term impairments and disability that influence the quality and quantity of an individual patient's recovery. Follow-up of survivors, and other services such as multi-professional rehabilitation, may shape recovery experiences by promoting restoration of health through identifying and appropriately managing unmet health needs associated with post intensive care syndrome<sup>1 2</sup>. International reports indicate increasing development of follow-up services of varying structure, format, and content<sup>3-9</sup>; however prevalence data demonstrate their scarcity of <sup>10 11</sup>, with no consistent, standardised model of service delivery<sup>2</sup>.

In the United Kingdom (UK), provision of follow-up and recovery services following critical illness is embedded in national rehabilitation guidelines published in 2009 that advocate a continuum of multi-professional input spanning the recovery pathway from ICU admission to community stages<sup>12 13</sup>. Considered the 'gold standard' for patient management, a face-to-face review of patients is specifically recommended at 2-3 months after critical care discharge, including a functional reassessment and onwards referral to appropriate rehabilitation or other specialist services<sup>12</sup>. However, a nationwide survey in 2013 reviewing implementation of these guidelines found that only 27% of UK intensive care units (ICU) adhered to this recommendation and only 12 (/176) organisations offered post hospital discharge rehabilitation programmes<sup>10</sup>. Lack of funding was both the most frequent, and highest ranking, barrier to providing services, alongside insufficient prioritisation and insufficient personnel and other resources<sup>10</sup>. The intervening years have witnessed increasing attention on recovery services for critically ill patients<sup>14-16</sup>, including the role of peer support<sup>17</sup>. Therefore, the aim of the current study was to comprehensively re-survey the current provision of recovery and follow-up services for adult critically ill patients across the UK to identify unmet areas of unmet need, inform service innovation, and benchmark against clinical standards.

## METHODS

### Service identification

The sample frame was all adult NHS ICUs across the UK (England, Scotland, Wales and Northern Ireland) identified using two central registries; the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme (available at <https://www.icnarc.org/Our-Audit/Audits/Cmp/About/Participation>) and the Scottish Intensive Care Society Audit Group (SICSAG, <https://www.sicsag.scot.nhs.uk/index.html>). A total of 242 individual hospitals were identified from the ICUs listed in these registries.

### Survey development

A cross-sectional, predominantly closed-question, online open-survey was designed by the investigators (see Supplementary File 1). Survey content was generated from collective clinical experience and expertise of the investigators using the previous survey as a foundation<sup>10</sup>. Survey questions were sequentially ordered, iteratively refined, with single or multiple response options created for each question, and inclusion of free-text options for further relevant detail. Pilot testing was by three independent, and one internal, critical care practitioners with specialist subject interest and experience. This process ensured content, construct, and face validity, and sensibility, to ensure i) comprehension and interpretation of questions, ii), flow, salience, acceptability, and ease of completion, iii) missing items or response options, and iv) time required to complete<sup>18</sup>. Survey content was also reviewed by members of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group. After refinement and optimisation, the final version was approved by the investigators.

Survey domains were: i) demographics of critical care services; ii) services delivered on inpatient wards after ending critical care, including the transfer process from ICU; iii) outpatient services delivered following hospital discharge; iv) service relationships with other local healthcare infrastructure; v)

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3 peer support programmes; and vi) physical rehabilitation programmes. Respondents were requested  
4 to report their *pre-COVID-19 pandemic* service provision. The final survey question requested  
5 respondents to report any changes to existing, or development of new, services due to the pandemic.  
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### 10 11 12 **Survey distribution**

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14 An invitation email containing the link to the online survey (hosted via Survey Monkey,  
15 <https://www.surveymonkey.com/>) and a Participant Information Sheet, was circulated via i) Faculty  
16 of Intensive Care Medicine membership, ii) national critical care networks across each of the four UK  
17 nations, iii) the National Institute for Health Research Critical Care National Specialty Group, iv) the  
18 ICNARC Case Mix Programme membership, v) professional contacts of the authors, and vi) related  
19 social media, that facilitated a snowballing approach to dissemination. Instructions for survey  
20 completion highlighted the need for a designated lead respondent to coordinate an accurate multi-  
21 professional response from each site. The survey was open for completion for a period of 8 weeks  
22 (June – August 2020), and repeated circulation of the survey, including targeted approaches to non-  
23 responders where possible, was undertaken during this period. A further 4 weeks was allowed for  
24 follow-up with sites on data queries.  
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### 41 **Patient and public involvement**

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43 Patients were not involved in the design, conduct, or reporting of this research as it was focused on  
44 surveying current clinical services. However, findings from this survey will inform white papers to be  
45 developed and reported by the Faculty of Intensive Care Medicine Life After Critical Illness Working  
46 Group which includes patient and family representation.  
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### 52 **Ethical approval, data management, and data analysis**

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55 The study was approved by King's College London Research Ethics Committee (MRA-19/20-17855),  
56 and is reported in keeping with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES)  
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3 19. Survey completion was considered indicative of informed consent for participation. Data were  
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5 downloaded from the survey platform into Microsoft Excel (Microsoft Corp, Washington, US), and  
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7 stored in password-protected files and devices. Multiple responses for any individual hospital site  
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9 were de-duplicated and amalgamated into one single response set. Respondents were contacted for  
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11 missing or erroneous data, or the most complete and/or first-received response set was used as the  
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13 final response option. Descriptive statistics were used to analyse quantitative responses including  
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15 normality testing, means and standard deviations (SD), medians and interquartile ranges, frequencies,  
16  
17 proportions, and 95% confidence intervals (CI) where appropriate. Summative content analysis was  
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19 used for free text comments<sup>20</sup>. A response rate of more than 70% was considered *a priori* to indicate  
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21 a representative sample<sup>18,21</sup>. Analyses were performed in Microsoft Excel and GraphPad Prism (v9.0,  
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23 GraphPad Software, San Diego, US).  
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## 32 RESULTS

### 33 Responding institutions

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35 In total 186 (/242, 76.9%, 95%CI 71.2 to 81.7%) individual hospitals registered a survey response. Ten  
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37 blank responses were discounted leaving 176 hospitals included in analysis (/242, 72.7%, 95%CI 66.8  
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39 to 78.0%); across the 4 UK nations, this comprised Scotland (n=23/23, 100.0%), Wales (n=12/15,  
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41 80.0%), Northern Ireland (n=7/9, 77.8%), England (144/195, 73.8%). Demographic data for  
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43 respondent hospitals are reported in Table 1.  
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### 50 Inpatient critical illness recovery and follow-up services

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52 All respondents reported processes for managing discharge handovers for patients transitioning from  
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54 critical care to the ward. Data describing these handover processes are reported in Supplemental File  
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56 2, Section E1. Following ICU step down, 127 (/176, 72.2%) operated a targeted inpatient  
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58 recovery/follow-up service, established for a median (IQR) of 10.0 (5.0-16.0) years. Twenty sites (/176,  
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3 11.4%) focused solely on outreach readmission prevention. Key features of services are summarised  
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5 in Table 2 and Supplemental File 2, Section E2. Diverse service models included bedside consultation,  
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7 education of ward staff around post ICU issues, information provision to patients and families, and  
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9 multi-professional ward rounds. Where services were available, they were primarily delivered by  
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11 nurses (n=115/127, 90.6%), physiotherapists (n=70/127, 55.1%), or ICU physicians (n=47/127, 37.0%),  
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13 with clinical psychology most frequently cited as lacking (n=55/127, 43.3%). Referrals were generated  
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15 from manual patient-list triages (n=80/127, 63.0%), automated systems (n=23/127, 18.1%), or  
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17 electronic patient records (n=20/127, 15.7%). Just over half of respondents (n=69/127, 54.3%) used  
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19 a screening tool to identify post intensive care issues (e.g. anxiety and depression, post-traumatic  
20  
21 stress disorder, physical and functional performance, delirium, or psychological status). Funding for  
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23 services was primarily from internal critical care funds (n=71/127, 55.9%) and institutional health  
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25 service funds (n=45/127, 30.6%) with other sources including organisational charities, grant funding,  
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27 non-critical care departments, or volunteer goodwill cover (all <10%).  
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### 35 **Outpatient critical illness recovery and follow-up services**

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37 Outpatient services were reported in 130 institutions (/176, 73.9%) established for a median (IQR) of  
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39 9.0 (4.0-15.0) years (Table 3, with expanded data reporting in Supplemental File 2, Section E3).  
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41 Magnitude of outpatient caseload varied from an estimated 10 to 500 new patients per year, and  
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43 subsequent outpatient re-evaluations ranging from an estimated 0 to 350 per year. An estimated  
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45 12,000 patients receive outpatient follow-up per year (at responding institutions only, out of  
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47 approximately 117,000 estimated annual ICU admissions). The predominant service model was an  
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49 outpatient clinical consultation lasting 30-60 minutes and scheduled 2-3 months following hospital  
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51 discharge. Patients are consulted by the multi-professional team all together (n=77/130, 59.2%) or  
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53 separately one at a time (n=42/130, 32.3%) by clinician(s), primarily comprising nurse (n=121/130,  
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55 93.1%), ICU physician (n=100/130, 76.9%), and physiotherapy (n=65/130, 50.0%) professions. In most  
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57 services (n=108/130, 83.1%), a combination of two, three, or more, different multi-professional  
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3 clinicians ran services (Figure 1, ODS Table E1). The professional discipline most frequently cited as  
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5 lacking was clinical psychology (n=61/130, 46.9%).  
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10 Clinician, and self, referrals, were the most common routes to access services. Similar numbers of  
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12 services reported acceptance (n=50/130, 38.5%), and non-acceptance (n=48/130, 36.9%), of referrals  
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14 from outside the geographical catchment area of the primary hospital (31 respondents, /130, 23.8%,  
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16 reported this as discretionary). Over half of services (58.5%) used a screening tool for post intensive  
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18 care issues, with a heterogenous range of outcome measures and/or tools for assessment  
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20 (Supplemental File 2, Table E2). Aspects of recovery addressed in follow-up consultations were  
21  
22 diverse and comprehensive, reflecting both symptom presentation as well as onwards referrals to  
23  
24 specialist services (Table 3); nearly all included a review of the patient's ICU history (n=123/130,  
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26 94.6%), and for the majority, an opportunity to visit to the ICU where they had been admitted  
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28 (n=114/130, 87.7%). Funding for services was primarily sourced from internal critical care funds  
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30 (n=65/130, 50.0%) with nearly a third underpinned by national health service-funding (n=38/130,  
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32 29.2%), and a small proportion unfunded (n=19/130, 14.6%).  
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### 39 **Barriers and challenges to offering recovery and follow-up services, and links with other services**

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41 Sites without inpatient or outpatient services cited the following barriers: lack of funding (n=35/46,  
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43 76.1%), insufficient staff (n=26/46, 56.5%), lack of space/venue (n=17/46, 37.0%), lack of service  
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45 prioritisation by management (n=17/46, 37.0%), lack of suitably trained staff (n=12/46, 26.1%),  
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47 resources prioritised to other patient groups/clinical areas (n=13/46, 28.3%), lack of evidence to  
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49 suggest benefit (n=8/46, 17.4%), insufficient patient numbers to justify (n=5/46, 10.9%), and  
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51 uncertainty regarding content to include in a service (n=3/46, 6.5%). Many of these resonated as  
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53 challenges to service delivery and maintenance reported by those with existing services (Tables 2 and  
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55 3), in particular issues of staffing, funding, and service prioritisation.  
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3 Three-quarters of respondents (133/176, 75.6%) reported links between their own and similar  
4 services in neighbouring institutions (Supplemental File 2, Section E4); categories fell broadly into two  
5 themes reflecting informal knowledge, practice, and service reciprocity, and formal referral pathway  
6 access and coordination. Links with primary care or community interface services were less frequent  
7 (87/176, 49.4%), with examples centring on either direct referral into services, or varied forms of  
8 engagement with primary care physicians.  
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### 19 **Peer support after critical illness**

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21 Peer support services for patients and families were available in nearly half of responding institutions  
22 (n=85/176, 48.3%) (Supplemental File 2, Section E5), predominantly as community or hospital-based  
23 support group meetings (n=57/85, 67.1%). Other formats included peer support groups based within  
24 ICU follow-up clinics (n=11/85, 12.9%) or within ICU (n=5/85, 5.9%), psychologist-led outpatient  
25 groups (n=4/85, 4.7%), or affiliation with ICU charity-led support groups (n=3/85, 3.5%).  
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29 Peer support varied between informal meetings (n=35/85, 41.2%), facilitated discussion (n=20/85,  
30 23.5%), or a structured agenda of talks and presentations (n=9/85, 10.6%). Twelve respondents (/85,  
31 14.1%) reported a 'drop-in' structure, and a further 9 (/85, 10.6%) reported a mixed, flexible approach.  
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33 On average, sessions (of any format or structure) were held a median (IQR) of 4.5 (4.0-9.0) times per  
34 year, although absolute frequency ranged largely (minimum-maximum 1.0-52.0 per year). Participant  
35 attendance was a median (IQR) of 10.0 (6.0-15.0) former patients and 6.0 (5.0-10.0) caregivers. Staff  
36 input was multi-professional; critical care nursing staff being involved in nearly all services (n=81/85,  
37 95.3%), with ICU physician (n=40/85, 47.1%) and allied health professional (n=39/85, 45.9%) staff  
38 involved in nearly half, and psychologists in 17 (/85, 20.0%). Most services were not affiliated to any  
39 formal networks (n=49/85, 57.6%). Where affiliation was in place (n=33/85, 38.8%), this was primarily  
40 with national UK networks (ICU Steps (<https://www.icusteps.org/>), n=27 and InS:PIRE  
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3 ([www.nhsggc.org.uk/inspire](http://www.nhsggc.org.uk/inspire)), n=2), and the international CAIRO network (Critical and Acute Illness  
4 Recovery Organization, <https://sites.google.com/umich.edu/cairo/home>, n=4).  
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### 10 **Post hospital discharge physical rehabilitation programmes**

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12 Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31  
13 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26/31, 83.9%),  
14 or in combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or  
15 rehabilitation assistant (all n=1/31, 3.2%, each). One programme was led by an exercise/sports  
16 therapist. Clinicians leading programmes were either ICU-specialist (n=19/31, 61.3%) or  
17 rehabilitation-specialist (n=12/31, 38.7%). Details of the structure, format, and content of physical  
18 rehabilitation programmes are reported in Supplemental File 2, Section E6.  
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### 30 **Future plans**

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32 Respondents' comments about future plans for their services (within 2-5 years), in terms of instigation,  
33 development, or expansion, were themed into categories (Table 4). The main two themes centred on  
34 expansion of current, and establishment of new, outpatient services.  
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### 41 **Impact of the COVID-19 pandemic**

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43 Nearly all respondents (n=162/176, 92.0%) described the impact of the COVID-19 pandemic on  
44 services. Themes characterising these effects (and frequency of occurrence) were: i) existing service  
45 capacity/activity increased or decreased (n=88/162, 54.3%), ii) existing service changed to telephone  
46 or virtual (n=74/162, 45.7%), iii) new services implemented (phone-based, face-to-face, virtual, or  
47 exercise) (n=57/162, 35.2%), iv) applying for funding/new service (n=44/162, 27.2%), v) existing  
48 service increased in frequency (n=20/162, 12.3%), vi) follow-up combined with respiratory medicine  
49 services (n=20/162, 12.3%), vii) no change (n=17/162, 10.5%), viii) shortened interval between review  
50 appointments (n=11/162, 6.8%), ix) addition of psychologist to service (n=6/162, 3.7%), x) research  
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3 about follow-up initiated (n=1/162, 0.6%). Full details of respondents' narrative comments are  
4 reported in Supplemental File 2, Section E7.  
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## 11 **DISCUSSION**

12 Findings from this comprehensive national survey characterise the continuum of multi-professional  
13 recovery, follow-up, and rehabilitation services currently provided for adult critically ill patients across  
14 the UK. Ward-based follow-up is highly prevalent, and a remarkable expansion of outpatient follow-  
15 up services is evident, whilst post hospital discharge physical rehabilitation programmes remain  
16 relatively low in number. Peer support services available in nearly half of sites support its importance  
17 for contributing to survivorship. Lack of funding commonly precluded service provision, and logistical  
18 and prioritisation barriers indicate that infrastructure and profile for services remains inadequate.  
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### 32 **Interpretation of the findings**

33 More than 70% of sites provided targeted longitudinal follow-up support to patients on the wards  
34 following ICU discharge with more than half incorporating screening for post intensive care syndrome.  
35 This is in keeping with recommended practice<sup>12</sup>, and signifies a practice of early identification and  
36 management of problems as well as onwards recovery planning. Comparative data on prevalence of  
37 inpatient recovery services are limited; one smaller previous survey reported only around one-third  
38 of sites were guideline-adherent on ward-based input following critical illness<sup>22</sup>.  
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50 Increased prevalence of outpatient services at 74% of institutions, compared with 27% previously<sup>10</sup>, is  
51 striking, and vastly exceeds international counterparts<sup>11</sup>. Underlying factors behind this considerable  
52 growth are unclear, but greater appreciation of the long-term consequences of critical illness from  
53 within the clinical community could be speculated given that half of services were funded via internal  
54 critical care sources, many were delivered within existing roles without dedicated additional time, and  
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3 clinician referral to services surpassed objective criteria. Scheduling of follow-up was also adherent  
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5 with national recommendations<sup>12</sup>. However, uni-professional service delivery by nursing staff  
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7 prevailed in the outpatient context despite the empirical value of many other disciplines, and even  
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9 though representation from clinical psychology doubled in outpatient compared to inpatient services,  
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11 this was the most frequently reported missing profession from both. This emphasises both the need  
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13 for investment in personnel, and the urgency of addressing psychological morbidity in survivors<sup>23-25</sup>,  
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15 which can influence engagement with other aspects of recovery, and contribute to hospital  
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17 readmission<sup>26</sup>. Likewise, occupational therapy is another example of a key profession that would  
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19 benefit from greater prevalence within services compared to the levels seen in the current findings,  
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21 especially in the context of long-term cognitive impairment in critical illness survivors<sup>27-29</sup>, and the  
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23 challenges of returning to work in this patient population<sup>30-33</sup>.  
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30 Engagement with primary care reduced from inpatient to outpatient stages of management.  
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32 Partnership with primary care is key to optimising quality of critical illness recovery<sup>34</sup>; Qualitative  
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34 exploration of unplanned hospital readmission in ICU survivors highlights many contributing themes  
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36 that primary care clinicians would be ideally placed to support during recovery e.g. multimorbidity,  
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38 polypharmacy, inadequate social support, and challenges with specialist equipment<sup>26 35</sup>. Improving  
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40 information provision on patients' ICU admissions and their consequences could be a simple yet  
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42 effective and valued strategy to start<sup>36 37</sup>, especially where primary care physicians may see relatively  
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44 few post ICU patients. Utilising remote, virtual platforms may facilitate this happening in person to  
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46 complement written or electronic forms. Furthermore, advocating a routine appointment for post  
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48 intensive care patients with their primary care clinician to review status early in the community stage  
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50 of recovery; this could be held jointly with a post ICU follow-up appointment for efficient shared  
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52 clinical management and learning.  
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3 Post hospital discharge physical rehabilitation programmes also increased since last surveyed. That  
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5 this increase is much more modest (from 7% to 18%) may be multifactorial, but one possibility is the  
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7 relative 'burden' of leading the delivery of such services by only one profession, namely physiotherapy  
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9 - lack of sufficient staff features highly as a barrier in the current dataset. Broadly, the structure,  
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11 format, and content, of delivery of physical rehabilitation programmes mirrored previously reported  
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13 findings, albeit two thirds of programmes still utilised referrals to other bespoke rehabilitation  
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15 programmes e.g. pulmonary and cardiac, to manage unmet need even though these may not cater  
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17 optimally for patients following critical illness<sup>10</sup>. The limited overall availability of these rehabilitation  
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19 services speaks to the need to consider alternative strategies to deliver therapeutic interventions.  
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21 One option is to consider home-based services, which may be essential for those patients where  
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23 mobility limitations preclude physical attendance at other venues, as well as those in rural areas, with  
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25 social isolation, or relatively less caregiver support. The impact of the COVID-19 pandemic has seen  
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27 an exponential rise in diverse models of care with greater use of virtual platforms that could be  
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29 investigated further in the future to ensure maximum inclusivity of patients into rehabilitation  
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31 programmes.  
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39 Peer support benefits patients, relatives, and staff during survivorship<sup>15 38 39</sup>. Six models have been  
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41 described<sup>17</sup>; our data indicate a predominance of community-based peer support with no evidence  
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43 for online delivery, albeit this may have evolved in the interim due to pandemic restrictions to physical  
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45 in-person meeting. Barriers (e.g. non-attendance, access to skilled facilitators, bureaucratic  
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47 limitations) and enablers (e.g. motivated interprofessional clinicians, patient and family volunteers,  
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49 links to ICU follow-up clinics) to peer support services have been previously explored through focus  
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51 group inquiry with clinicians<sup>14 17</sup>. As peer support continues to embed within the armamentarium of  
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53 post critical illness recovery, including for patients surviving post COVID-19<sup>40</sup>, our data can be used to  
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55 support the emergence of other models of delivery within the UK setting, with reference to these  
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3 barriers and enablers to ensure individual participant preferences for mode of engagement with peer  
4 support are met.  
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10 Lack of funding most often precluded delivery of critical illness recovery and follow-up services,  
11 followed by availability of sufficient staff; these, and other findings on reported barriers, closely mirror  
12 previous data<sup>10</sup>. A key issue affecting funding and deliverability is disparity between commissioning  
13 processes, often at national and local level respectively for inpatient and outpatient critical care  
14 services, that currently do not mandate adherence to the national guidelines. This disconnect fails to  
15 reflect the continuum over which recovery occurs from ICU admission to discharge home, and the  
16 attainment of individualised goals of recovery. Reliance on bespoke local commissioning applications  
17 to source funding therefore directly affects equity of access to critical care outpatient services. Key to  
18 application success are the strength of national guidelines, quality standards, patient/caregiver value,  
19 and the observation from care quality commissioners that inpatient services are impacted positively  
20 by outpatient follow-up. However, these empirical-reported benefits are often insufficient to secure  
21 funding, as reflected in this survey, because they are frequently countered by demands for evidence  
22 to demonstrate clinical and cost effectiveness; at present neither follow-up clinics or post hospital  
23 discharge physical rehabilitation programmes are supported by meta-analysis data<sup>2 41</sup>, and there is an  
24 absence of consensus on the most appropriate metric to reflect 'success'. Evidence-gaps exist around  
25 the optimum version of either modality and the service-user voice is often missing in shaping  
26 research<sup>15</sup>. Reliance on internal funding sources to deliver services results in the disparity in workforce  
27 composition seen in our findings. In the future, standardising data collection across services may serve  
28 to build evidence around the impact on patient outcomes.  
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54 How much the COVID-19 pandemic influences the current landscape of critical illness recovery, follow-  
55 up, and rehabilitation services, in the long-term remains to be seen<sup>42 43</sup>. Our findings indicated both  
56 'positive' (e.g. service expansion, addition of professional specialties) and 'negative' (e.g. lack of  
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3 resources, loss of physical in-person contact) impacts. We also detected a signal towards service  
4 digitisation, albeit this would require careful management to prevent issues such as digital poverty  
5 and literacy from limiting access. In the UK, post-COVID-19 follow-up clinics are underpinned by large-  
6 scale national funding, and aim to address short- and long-term sequelae affecting patients <sup>44</sup>, but  
7 there are also data reporting international efforts <sup>45</sup>, as well as empirical reports of local service  
8 development. We posit that the current data, detailing existing national services at a granular level,  
9 may be informative for future commissioning and policy-makers in directing resources towards  
10 services for *all* patients recovering from critical illness, irrespective of causal illness or injury, to ensure  
11 evidence-based provision of care. A blended payment model for critical care services, incorporating  
12 an outpatient tariff within the outcome element would be transformational. This would provide  
13 financial resources for all ICUs to include post ICU discharge services (whereas existing funding is  
14 limited to the ICU period), enabling the standardisation and improvement in the equity of access of  
15 services for patients across all four nations.

### 31 32 33 34 **Critique of the method**

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36 This study benefits from a number of strengths. Sampling was through two national registries, and  
37 survey design was rigorous and comprehensive, including external pilot testing. The inclusion of *in-*  
38 hospital services increases the value of the current dataset that now provides detailed  
39 characterisation on available services across the continuum of critical illness recovery. Survey  
40 platform functionality was maximised to mitigate respondent burden or fatigue<sup>46</sup>. Survey  
41 dissemination adopted multiple methods and respondents represented a wide range of professions.  
42 This approach facilitated a high response rate exceeding our *a priori* threshold for representativeness,  
43 with minimal missing data.

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48 We encouraged a coordinated multi-professional response from each institution anticipating  
49 enhanced accuracy of data. However, any limitation in availability or cooperation of colleagues could  
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3 hypothetically have impacted the quality and reliability of responses. Furthermore, limited data on  
4 non-responders precluded comparison with responders to detect presence of any response bias<sup>21 47</sup>.  
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6 For pragmatic purposes we sought one survey response per hospital, regardless of the number, size,  
7 or specialty of ICUs at that hospital. However, some bespoke differences may exist in recovery,  
8 rehabilitation, and follow-up services according to ICU specialty that were not detectable in the  
9 current survey. Where more than one unique hospital was part of a single overarching healthcare  
10 provider, we still required an individual survey response per hospital to account for potential inter-  
11 hospital differences in services.  
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23 Our data reflect UK National Health Service provision (as of mid-2020), potentially impacting  
24 extrapolation of findings to other healthcare jurisdictions. UK national guidelines offer a valuable  
25 scaffold to guide patient management. However, the granular, multi-centre, national-level data  
26 clearly demonstrate a wide range of recovery and follow-up services of varying structure, format,  
27 content, staffing, and delivery, and from a diverse population of hospitals. As such, clinicians from  
28 other international healthcare settings could consider elements for potential adaptation and  
29 translation into local services. In the future, international consensus from professional organisations  
30 around the key components of post critical care services would be beneficial.  
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## 43 **CONCLUSION**

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45 This study provides a comprehensive snapshot of the UK landscape of post critical illness recovery,  
46 follow-up, and rehabilitation services, including an indication of the impact of pandemic  
47 circumstances. Service sustainability will require improved referral pathways, enhanced partnership  
48 with primary care, greater medical engagement, and adoption of national standards. These data  
49 complement national and international efforts to optimise quality of care and outcomes of survivors  
50 of critical illness.  
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### **AUTHOR CONTRIBUTIONS**

BC, AS, CW, and JM conceived and designed the study. BC drafted an initial survey version, and all authors (BC, RM-C, CA, CB, JM, TQ, JS, AS, CW, EW, JM) contributed to iteration and refinement in survey content and design. BC, CA, CB, EW, JS, CW, facilitated survey dissemination via established networks. BC was responsible for overall data acquisition via the online survey platform. BC and RMC analysed the data. BC and JM interpreted the data and agreed data reporting. BC drafted and revised manuscript versions, and all authors (BC, RM-C, CA, CB, JM, TQ, JS, AS, CW, EW, JM) agreed the final manuscript version for submission.

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## DATA SHARING STATEMENT

Data are not publicly available for confidentiality reasons, however all data are reported.

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## FIGURE LEGENDS

**Figure 1.** Composition (A) and size (B) of multi-professional teams delivering outpatient recovery and follow-up services

### *Legend*

- A. Bar graph depicts number of outpatient services with various multi-professional team combinations. Detail of each corresponding profession is summarised in the table below. Total number of services = 130. Table E1 (Online Data Supplement) provides additional data on exact frequencies of occurrence of each combination. n (%) detailed by each profession reports the frequency of involvement of each profession across all 130 outpatient services. n=14 (10.8%) of 'Other' professions involved: Citizens Advice Bureau, n=4, Volunteers, n=2, Carers Association, n=2, Cognitive Behavioural Therapy, Rehabilitation Team, Advanced Critical Care Practitioner, Patient Liaison Service, Head Injury Specialist, Health Promotion Advisor, all n=1. Generic Rehabilitation Assistants are healthcare workers (some may have healthcare qualifications, but this is not essential) who offer support to qualified clinicians with carrying out various rehabilitation activities with patients.
- B. Pie chart summarises the relative proportion of each team size (regardless of composition)

*Abbreviations:* PT = physiotherapist; OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner.

## TABLES

**Table 1.** Demographics of respondent hospitals

Characteristic	n (/176, %)
Type of hospital	
District general	99 (56.3)
University teaching	63 (35.8)
Specialist centre	11 (6.3)
Other <sup>a</sup>	3 (1.7)
Profession of survey respondent	
Medic	79 (44.9)
Nurse	42 (23.9)
Physiotherapist	21 (11.9)
Other <sup>b</sup>	34 (19.3)
Critical Care service metrics	
Total critical care beds	3979
- Total ICU capability	2382
- Total HDU capability	1597
Estimated annual ICU admissions	116944
Type of critical care unit <sup>c</sup>	
General (mixed medical and surgical)	167 (94.9)
Trauma	52 (29.5)
Cardiothoracic	35 (19.9)
Neurological/Neurosurgery	34 (19.3)
Spinal	28 (15.9)



Liver	26 (14.8)
Burns	19 (10.8)
ECMO	9 (5.1)
Other <sup>d</sup>	37 (21.0)

*Abbreviations:* UK = United Kingdom; ICU = intensive care unit; HDU = high dependency unit; ECMO = extracorporeal membrane oxygenation

*Legend:* <sup>a</sup>Other includes: University-affiliated and Specialist combined, n=3. <sup>b</sup>Other includes: i) Profession not specified/reported, n=26 (e.g. Team Lead, Clinical Director, Ward Manager), ii) Various, n=5 (e.g. Clinical Educator, Audit lead), iii) Psychologist, n=2, iv) Dietitian, n=1. <sup>c</sup> Respondents could select more than one response therefore % exceeds 100%.

<sup>d</sup>Other denotes various specialties e.g. oncology, maxilla-facial, obstetrics, renal.

**Table 2.** Features of targeted inpatient recovery and follow-up services following critical illness

Feature	Options	n/127 (%)
Type of service provision <sup>a</sup>	Outreach/rapid response (patient outcomes) Engagement/education of ward staff re: post ICU issues Information provision ICU physician /AHP/nurse ward round Family support Psychological intervention Generic rehabilitation assistant/care coordinator Peer support Formal MDT meeting Research/academic contact Other <sup>b</sup>	71 (55.9) 65 (51.2) 62 (48.8) 47 (37.0) 36 (28.3) 36 (28.3) 25 (19.7) 23 (18.1) 17 (13.4) 8 (6.35.4) 15 (11.8)
Eligibility criteria	All patients Length of stay in critical care <sup>c</sup> Clinician/ward referral Days of mechanical ventilation <sup>d</sup> Type of therapies received during critical care admission Self-referral Diagnosis at critical care admission Other <sup>e, f</sup>	72 (56.7) 54 (42.5) 37 (29.1) 31 (24.4) 21 (16.5) 14 (11.0) 11 (8.7) 28 (19.0)
Professions involved in service delivery	Nurse Physiotherapist ICU physician Speech and Language Therapist	115 (90.6) 70 (55.1) 47 (37.0) 41 (32.3)

	Dietitian	39 (30.7)
	Occupational Therapist	27 (21.3)
	Pharmacist	27 (21.3)
	Generic rehabilitation assistant	19 (15.0)
	Psychologist	17 (13.4)
	Administrative support	13 (10.2)
	Social Worker	8 (6.3)
	Psychiatrist	5 (3.9)
	Other <sup>g</sup>	19 (15.0)
Key challenges to delivering and sustaining services	Staffing number	104 (81.9)
	Time	90 (70.9)
	Staffing profile	43 (33.9)
	Patient location	25 (19.7)
	Environment	21 (16.5)
	Funding	12 (9.4)
	Other <sup>h</sup>	14 (11.0)

Abbreviations: ICU = intensive care unit. MDT = multidisciplinary team. NHS = National Health Service

Legend: <sup>a</sup>99 sites reported outreach services for readmission prevention in addition to targeted recovery and follow-up services. <sup>b</sup>Other includes: Nurse review, n=6, Multiprofessional input, n=6, Patient support, n=2, Physiotherapy input, n=1. <sup>c</sup>>2 days, n=1, 3 days, n=6, >3 days, n=8, 4 days, n=1, >4 days, n=5, >7 days, n=3. <sup>d</sup>Any, n=1, 2 days, n=1, 3 days, n=2, >3 days, n=4, >4 days, n=5. <sup>e</sup>Other includes: Patient pathway, n=7, Delirium, n=7, Rehabilitation needs, n=5, Psychological status, n=3, Physical status, n=3, Age, n=2, Illness acuity level, n=1. <sup>f</sup>Patients receiving palliative care, or other specialist care/diagnosis-related pathways, and routine post-operative patients were generally not included in services. <sup>g</sup>Other includes: Outreach Team, n=14, Other rehabilitation/medical healthcare professionals, n=3, Advanced Critical Care Practitioner and Counsellor, both n=1. <sup>h</sup>Other includes: Staffing capacity, n=5, Lack of service prioritisation by management, n=3, Staff engagement with service, n=3, Staff recruitment, n=2, Links with primary care, Resources, and Appropriate service focus, all n=1.

**Table 3.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (/130, n, %)
Eligibility criteria	Clinician referral	60 (46.2)
	Self-referral	49 (37.7)
	Diagnosis	22 (16.9)
	Length of stay critical care <sup>a</sup>	18 (13.8)
	Days of mechanical ventilation <sup>b</sup>	17 (13.1)
	Therapies received	11 (8.5)
	All patients	8 (6.2)
Process for identifying eligible patients	Triage of all critical care discharges	79 (60.8)
	Review of care records	52 (40.0)
	Local database	45 (34.6)
	Verbal clinician referral	37 (28.5)
	Automated IT process	19 (14.6)
	EPR request for clinic appointment	10 (7.7)
	Blanket invitation to all patients (no triage)	9 (6.9)
Process of monitoring patients	Ad hoc patient list/spreadsheet	94 (72.3)
	Automated process	15 (11.5)
	Electronic patient record-generated list	13 (10.0)
	Other database	3 (2.3)

Method of patient contact regarding appointment	Postal letter	124 (95.4)
	Telephone call	88 (67.7)
	Text reminder	20 (15.4)
	Other <sup>e</sup>	10 (7.7)
Funding sources for outpatient services <sup>f</sup>	Funded internally from critical care funds	65 (50.0)
	National health service funding	38 (29.2)
	Volunteer/goodwill only	19 (14.6)
	Other internal institutional funding	7 (5.4)
Aspects of consultation	Review of ICU history and ICU events	123 (94.6)
	Patient visit to ICU	114 (87.7)
	Assessment of sleep	99 (76.2)
	Physical function assessment	96 (73.8)
	Return/review of ICU diary	94 (72.3)
	Physiotherapy referral	91 (70.0)
	Psychological assessment	86 (66.2)
	Clinical psychology referral	70 (53.8)
	Lifestyle/risk factor review	69 (53.1)
	Dietitian referral	67 (51.5)
	Speech and Language Therapy referral	60 (46.2)
	Family/caregiver needs assessment	54 (41.5)
	Review of goals and preferences of care	53 (40.8)
	Employment/occupation review	50 (38.5)
	Assessment of sexual function	49 (37.7)
	Occupational Therapy referral	47 (36.2)
	Nutritional assessment	47 (36.2)

	Pharmacy review/medicines reconciliation	46 (35.4)	
	Cognitive assessment	38 (29.2)	
	Vital signs/observations	33 (25.4)	
	Physical examination	33 (25.4)	
	Social needs assessment	33 (25.4)	
	Travel assessment (e.g. driving, flying)	31 (23.8)	
	Assessment of financial status	19 (14.6)	
	Occupational function assessment	13 (10.0)	
	Speech and language assessment	12 (9.2)	
	Psychiatric assessment	11 (8.5)	
	Immunisation review	10 (7.7)	
	GP referral/information	8 (6.2)	
	Other <sup>g</sup>	7 (5.4)	
Duration of appointment		New <sup>h</sup>	Follow-Up <sup>i</sup>
	<30 minutes	3 (2.3)	24 (18.5)
	30 minutes – 1 hour	67 (51.5)	61(46.9)
	1.0-1.5 hours	46 (35.4)	15 (11.5)
	1.5-2 hours	7 (5.4)	2 (1.5)
	2-2.5 hours	2 (1.5)	3 (2.3)
	2.5-3.0 hours	2 (1.5)	0
	>3 hours	2 (1.5)	0
Other	0	13 (10.0)	

Key challenges to delivering and sustaining services	Time	107 (82.3)
	Funding	95 (73.1)
	Personnel	71 (54.6)
	Space	67 (51.5)
	Perceived value or priority	52 (40.0)
	Managerial engagement	37 (28.5)
	Pressure from other services	27 (20.8)
	Staff engagement	15 (11.5)
	Other <sup>i</sup>	10 (7.7)

*Abbreviations:*

*Legend:* <sup>a</sup>≥2 days, n=6, ≥3 days, n=15, ≥4 days, n=6, ≥5 days, n=6, ≥7 days, n=4, >14 days, n=1. <sup>b</sup>>24 hours, n=1, ≥2 days, n=5, ≥3 days, n=12, ≥4 days, n=6, ≥5 days, n=7. <sup>c</sup>Other includes: Illness acuity, n=6, post intensive care syndrome, n=5, delirium, n=5, psychological problems, n=3, age, n=2, neurological impairment and locality, both n=1. Short length of stay (< 48 hours) and/or non-ventilated patients generally not deemed eligible for follow-up. <sup>d</sup>Other includes: Self-referral, n=1, via support group, n=1. <sup>e</sup>Other includes: Given appointment prior to hospital discharge, n=5, Email, n=4, Information leaflet, n=1. <sup>f</sup>n=1 missing response. Respondents (n=7) also commented that commissioned services for some patients e.g. trauma were available, that Outreach services and Charity support contributed some funding, and that some elements of some services were unfunded. <sup>g</sup>Other includes: General review, n=3, Signposting to local services, Referral to other specialties, Patient/relative feedback on service, Cardiac/respiratory/exercise referral, all n=1. <sup>h</sup>n=1 missing response. <sup>i</sup>Other includes: No subsequent follow-up appointment, n=10, No consistent follow-up appointment, n=2, Variable duration, n=1. <sup>j</sup>Other includes: None, n=2, Lack of administrative support and lack of referral pathways, n=2, Lack of community services, patient engagement, insufficient patient need, and current pandemic, all n=1.

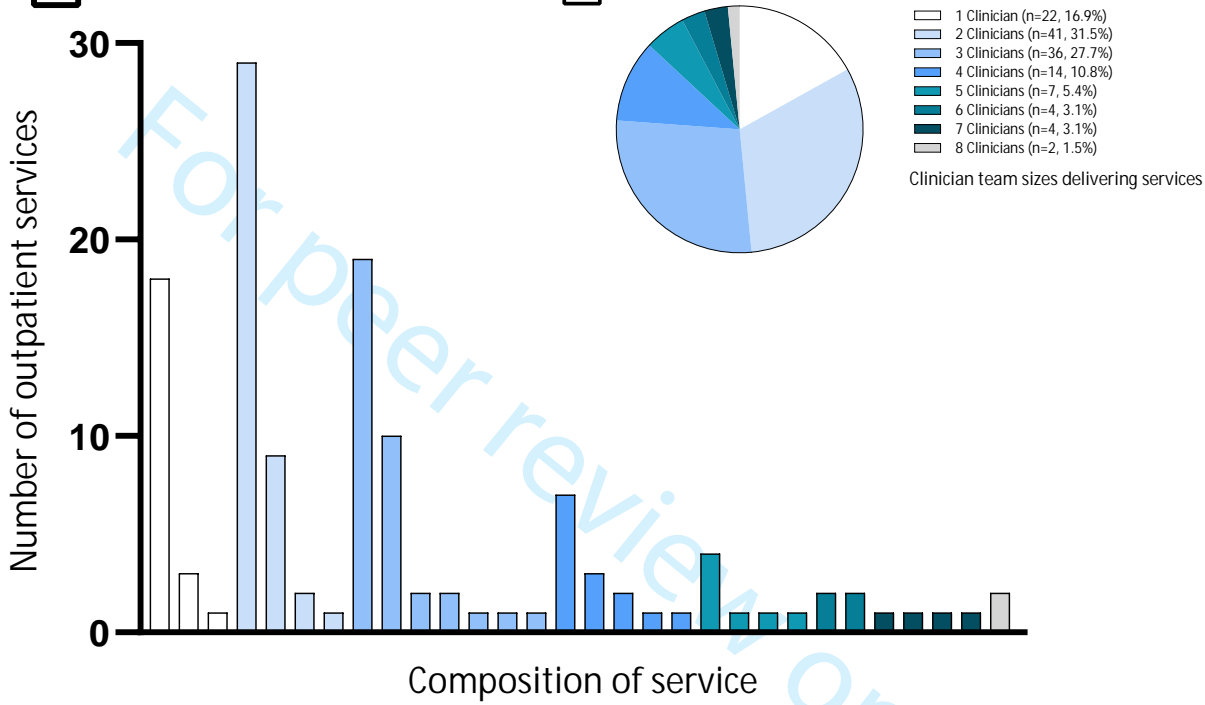
**Table 4.** Themes characterising future plans for service development in next 2-5 years

Theme	Frequency of occurrence (/176) (n (%))
Expand current outpatient services	46 (26.1)
Start new outpatient service	40 (22.7)
Start new psychology service	23 (13.1)
Expand current inpatient services	23 (13.1)
Start new inpatient service	19 (10.8)
Start new exercise rehabilitation programme	13 (7.4)
Maintain current services	13 (7.4)
Establish new pathways with rehabilitation and specialist services	4 (2.3)
Nil specified	46 (26.7)



**A**

**B**



	n (%)
Nurse	121 (93.1)
Intensivist	100 (76.9)
DT	65 (50.0)
PT	14 (10.8)
Psychologist	36 (27.7)
Psychiatrist	3 (2.3)
SLT	9 (6.9)
GRA	1 (0.8)
Dietitian	11 (8.5)
Pharmacist	10 (7.7)
GP	1 (0.8)

	1 clinician	2 clinicians	3 clinicians	4 clinicians	5 clinicians	6	7 clinicians	8
Nurse	•	• •	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	•
Intensivist	•	•	• • • • •	• • • • •	• • • • •	• • • • •	• • • • •	•
DT		•	• •	• • • • •	• • • • •	• • • • •	• • • • •	•
PT			•	•	•	•	•	•
Psychologist			•	• •	•	• •	• •	• •
Psychiatrist				•	•			•
SLT				•		•		• •
GRA				•				
Dietitian					• •	•	• • • •	•
Pharmacist					•	•	• •	• •
GP							•	

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## A UK wide survey of recovery and follow-up services following adult critical illness

### A UK wide survey of recovery and follow-up services following adult critical illness

**You are invited to participate in this cross-sectional survey to describe recovery and follow-up services available for adult critical care patients across the UK. We wish to collect information about services normally delivered at your organisation, and that were/are in place *prior* to the COVID-19 pandemic. There is opportunity to describe any changes in services as a result of the pandemic at the end of the survey.**

**Please read the accompanying Participant Information Sheet before progressing to complete this survey. This study has been approved by King's College London (MRA-19/20-17855), and completion of this survey implies your consent to participation.**

#### **Why is the survey being done?**

**The aims of the survey are:**

- 1. To evaluate the provision of recovery and follow-up services for adult critical care patients in line with NICE CG83 guidance**
- 2. To characterise these services in terms of location, content, format, structure, resource and funding**
- 3. To explore factors influencing availability of these services**

**This survey will be an update of an earlier published one (Connolly et al, BMJ Open, 2014, 4, e004963). For additional reference, please see the NICE CG83 'Rehabilitation After Critical Illness' Guidelines <https://www.nice.org.uk/Guidance/CG83>, and Quality Standards <https://www.nice.org.uk/guidance/QS158>.**

#### **What will the data be used for?**

**The findings will inform the Life After Critical Illness Workstream being undertaken by the Faculty of Intensive Care Medicine (Chair, Dr Carl Waldmann). Survey findings will be shared with the Faculty of Intensive Care Medicine for this purpose. Findings will also be disseminated in a peer-reviewed journal publication; these will be anonymous.**

**The overall goal of this work is to influence the development of robust, equitable, and well-resourced critical illness recovery and follow-up services across the UK.**

#### **How will the survey be done?**

**The survey should take approximately 30-45 minutes to complete, depending on the available services at your organisation; if you do not have any available services, completion time will be much quicker.**

**Questions will cover:**

- 1. Detail of your organisation and critical care services**
- 2. Provision of recovery and follow-up services on the ward following critical care discharge**
- 3. Provision of recovery and follow-up services after hospital discharge**

1  
2 **The survey questions are designed to collect information about all aspects of available follow-up**  
3 **services. We envisage that you will act as a principal responder/representative to coordinate the**  
4 **survey response at each organisation. You are encouraged to liaise with relevant multi-professional**  
5 **colleagues to provide full and accurate responses.**  
6  
7

8 **As the scope of services are known to be broad and diverse, completion of the free-text spaces for**  
9 **details not captured by the survey questions is encouraged.**  
10

11 **We would also like to potentially contact you in the future regarding the information you have**  
12 **provided in this survey (this is included in the consent to participate section). Do be sure to**  
13 **understand this section before submitting your full survey.**  
14  
15

16 **If you have any questions relating to the survey or its completion, please contact:**  
17

18  
19 **Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)**

20 **Dr. Joel Meyer (for the FICM, Joel.Meyer@gstt.nhs.uk)**  
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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 1: Lead Respondent Details

1. Name

2. Role/Job title

3. Place of Work

4. Email

5. Phone Number



## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 2: Adult Critical Care and Follow-Up Services at your institution

Please begin by telling us about your organisation and its adult critical care services.

\* 6. What is the name of your NHS Hospital?

\* 7. Type of hospital

- University-affiliated
- District general
- Specialist centre
- Other (please specify)

\* 8. Total number of Level 3 critical care beds

\* 9. Total number of Level 2 critical care beds

\* 10. Estimated annual Level 3 critical care admissions

\* 11. Please indicate all the specialist critical care services available at your hospital (Tick all that apply)

- |   |                                 |
|---|---------------------------------|
| <input type="checkbox"/> General (mixed)        | <input type="checkbox"/> Trauma |
| <input type="checkbox"/> Neurology/Neurosurgery | <input type="checkbox"/> ECMO   |
| <input type="checkbox"/> Cardiothoracic         | <input type="checkbox"/> Burns  |
| <input type="checkbox"/> Liver                  | <input type="checkbox"/> Spinal |
| <input type="checkbox"/> Other (please specify) |                                 |

1 \* 12. Many hospitals now offer recovery and follow up services for adult critically ill patients (separate to any  
2 defined specialty-specific pathways such as cardiac, trauma, or neuro- rehabilitation). For example:  
3

- 4 · *Inpatient/ward service*
- 5 · *Outpatient clinic*
- 6 · *Outpatient group programme*
- 7 · *Exercise/rehab class*
- 8 · *Peer support group*
- 9 · *Telephone/telehealth follow up*
- 10 · *MDT meeting independently of patient*
- 11 · *Web-based interface*
- 12 · *Postal survey*
- 13 · *Community-based*
- 14
- 15
- 16
- 17

18 Pre-COVID, if you normally DO offer any such recovery or follow up services at your hospitals please tick Yes  
19 and move on to the next question  
20

21 If you DO NOT offer such services please tick No and then progress to Section 3.

22  Yes

23  No

24  
25  
26  
27  
28 If you answered Yes to Q12, please use sections 13-17 to tell us about each type of service that you offer; use a separate section for  
29 each component  
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### 13. Recovery/Follow Up Service 1

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow*

*up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

### 14. Recovery/Follow Up Service 2

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow*

*up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

1 15. Recovery/Follow Up Service 3

2 Name given to your  
3 service

4  
5 Which of the following  
6 descriptors best describes  
7 this service?

8 *Inpatient/ward service*

9 *Outpatient clinic*

10 *Outpatient group*

11 *programme*

12 *Exercise/rehab class*

13 *Peer support group*

14 *Telephone/telehealth follow*

15 *up*

16 *MDT meeting*

17 *independently of patient*

18 *Web-based interface*

19 *Postal survey*

20 *Community-based*

21 Which patients and which  
22 units does it include? (NB:  
23 Specific eligibility criteria  
24 covered later)

25 *All critical care patients*

26 *A subset of patients only*

27 *Other (please specify)*

30 16. Recovery/Follow Up Service 4

31 Name given to your  
32 service

33  
34 Which of the following  
35 descriptors best describes  
36 this service?

37 *Inpatient/ward service*

38 *Outpatient clinic*

39 *Outpatient group*

40 *programme*

41 *Exercise/rehab class*

42 *Peer support group*

43 *Telephone/telehealth follow*

44 *up*

45 *MDT meeting*

46 *independently of patient*

47 *Web-based interface*

48 *Postal survey*

49 *Community-based*

50  
51 Which patients and which  
52 units does it include? (NB:  
53 Specific eligibility criteria  
54 covered later)

55 *All critical care patients*

56 *A subset of patients only*

57 *Other (please specify)*



## 17. Recovery/Follow Up Service 5

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 3: Transferring from Critical Care to a Hospital Ward

\* 18. What is the process of discharge from critical care to hospital ward? (Tick all that apply)

Face to face handover

Telephone handover

Written handover

Other (please specify)

\* 19. What is included in the discharge process? (Tick all that apply)

Medical handover

Psychological/cognitive rehabilitation plan

Nursing handover

Nutritional plan

Medicines reconciliation

Occupational Therapy plan

Physical rehabilitation plan

Speech and Language therapy plan

Other (please specify)

\* 20. In what form is the critical care discharge summary provided to the ward team?

Paper

Digital

Both

\* 21. Is a critical care discharge summary sent to the General Practitioner at this stage?

Yes

No

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 4: Inpatient/Hospital Ward Services

We would now like to understand about inpatient/ward services for adult critically ill patients i.e. services applying to the period between critical care discharge and discharge from hospital.

\* 22. Do you provide inpatient follow-up services in the general wards after discharge from critical care?

Yes

No

If No, please state reasons why and then progress to Section 5

\* 23. For how long has this service been implemented?

0

Years

30



24. By what name is this service known? (If applicable)

1 \* 25. What form does this inpatient contact take? (Tick all that apply)

- 2  Outreach/rapid response (focussed on readmission prevention)
- 3  Peer support
- 4  Outreach/rapid response (focussed on outcomes)
- 5  Information provision
- 6  Generic rehabilitation assistant/care coordinator
- 7  Psychological intervention
- 8  Intensivist/AHP/nurse ward round
- 9  Research/academic contact
- 10  Formal MDT meeting
- 11  Engagement/education of ward staff about post ICU problems
- 12  Family support
- 13  Other (please specify)

14

15

16

17

18

19 \* 26. What criteria are used to select patients for inpatient follow-up? (Tick all that apply)

- 20  All patients
- 21  Diagnosis at critical care admission
- 22  Length of stay critical care (if based on this, indicate number in Other section)
- 23  Self-referral
- 24  Clinician/ward referral
- 25  Days of mechanical ventilation (if based on this, indicate number in Other section)
- 26
- 27  Type of therapies received during critical care admission
- 28
- 29  Other (please specify)
- 30

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39 \* 27. Are any specific categories of patients excluded?

40

41

42

43 \* 28. How are referrals for inpatient follow-up monitored?

- 44  Automated process
- 45  EPR generated list
- 46  Ad hoc patient list/spreadsheet
- 47  Other (please specify)
- 48
- 49
- 50
- 51

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\* 29. Which professions provide the inpatient service? (Tick all that apply)

- |   |  |
|---|--|
| <input type="checkbox"/> Administrator                    | <input type="checkbox"/> Pharmacist                    |
| <input type="checkbox"/> Dietitian                        | <input type="checkbox"/> Physiotherapist               |
| <input type="checkbox"/> Generic rehabilitation assistant | <input type="checkbox"/> Psychiatrist                  |
| <input type="checkbox"/> Intensivist                      | <input type="checkbox"/> Psychologist                  |
| <input type="checkbox"/> Nurse                            | <input type="checkbox"/> Social Worker                 |
| <input type="checkbox"/> Occupational Therapist           | <input type="checkbox"/> Speech and Language Therapist |
| <input type="checkbox"/> Other (please specify)           |  |

\* 30. What is the profession of the person who leads this inpatient service?

\* 31. Is there any profession missing from the inpatient service that you would ideally include?

\* 32. How is this inpatient follow-up service funded?

- |  |  |
|--|--|
| <input type="radio"/> NHS funding e.g. commissioned service or other sustained NHS funding route | <input type="radio"/> Grant funding – dedicated grant for this activity            |
| <input type="radio"/> Funded internally from existing critical care funds                        | <input type="radio"/> Grant funding – allied to other ICU-related research studies |
| <input type="radio"/> Other internal institutional funding (specify in Other Section)            | <input type="radio"/> Volunteer/goodwill only                                      |
| <input type="radio"/> Other (please specify)   |  |

\* 33. Do you use a screening tool for post intensive care issues?

- Yes
- No

If Yes please describe briefly

1 \* 34. Describe the major challenges delivering and sustaining this inpatient service?  
2

- 3  Time  
4  Staffing number  
5  Staffing profile  
6  Environment  
7  Patient location  
8  Other (please specify)  
9

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 5: Outpatient Services following Hospital Discharge

We would now like to understand about outpatient services for adult critically ill patients i.e. services delivered following discharge from hospital.

\* 35. Do you provide follow-up services for adult critically ill patients following discharge from hospital?

Yes

No

If No please state reasons why and then progress to Section 6

\* 36. For how long has this service been implemented?

0

Years

30



37. By what name is this service known? (if applicable)

\* 38. How many 'new' patients attend per year (estimate)?

\* 39. How many 'follow-up' patients (i.e. subsequent visits) attend per year (estimate)?

\* 40. When does the follow-up first occur?

1 month after discharge from hospital

2-3 months after discharge from hospital

6 months after discharge from hospital

Other (please specify)

1 \* 41. What criteria are used to select patients for outpatient follow-up? (Tick all that apply)

- 2  All patients  Based on diagnosis
- 3
- 4  Length of stay critical care (if based on this, indicate number in  Self-referral
- 5 Other Section)
- 6  Clinician referral
- 7  Days of mechanical ventilation (if based on this, indicate
- 8 number in Other Section)
- 9  Based on therapies received
- 10
- 11  Other (please specify)
- 12

13

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20 \* 42. Are any specific categories of patients excluded?

21

22

23

24

25 \* 43. How are eligible patients identified? (Tick all that apply)

- 26  Automated IT process generates the list  EPR request for clinic appointment
- 27
- 28  Review of care records  Blanket invitation (no triage)
- 29
- 30  Manual/active triage of all critical care discharges  Verbal clinician referral
- 31
- 32  Local database
- 33
- 34  Other (please specify)
- 35

36

37

38

39 \* 44. Do you accept patients outside of your hospital or region to attend the service?

- 40  Yes
- 41
- 42  No
- 43
- 44  Additional Comments
- 45

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1 \* 45. How are patients tracked until their appointment?  
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- 4  Automated process  
5  EPR generated list  
6  Ad hoc patient list/spreadsheet  
7  Other (please specify)  
8

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12 \* 46. How are patients contacted/invited? (Tick all that apply)  
13

- 14  Telephone call  
15  Postal letter  
16  Given appointment prior to hospital discharge  
17  Text reminder  
18  Other (please specify)  
19

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21  
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23 \* 47. Which professions provide the outpatient service? (Tick all that apply)  
24  
25

- 26  Administrator  Pharmacist  
27  Dietitian  Physiotherapist  
28  Generic rehabilitation assistant  Psychiatrist  
29  GP  Psychologist  
30  Intensivist  Social Worker  
31  Nurse  Speech and Language Therapist  
32  Occupational Therapist  
33  Other (please specify)  
34  
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39 \* 48. What is the profession of the person who leads this outpatient service?  
40  
41

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45 \* 49. Is there any professions missing from the outpatient service that you would ideally include?  
46  
47

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1 \* 50. How is this outpatient service funded?  
2  
3

- 4  NHS funding e.g. commissioned service or other sustained NHS funding route  
5  Funded internally from existing critical care funds  
6  Other internal institutional funding (specify in Other section)  
7  Grant funding – dedicated grant for this activity  
8  Grant funding – allied to other ICU-related research studies  
9  Volunteer/goodwill only  
10  
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12

13 Other (please specify)  
14

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19  
20 \* 51. What is the approximate tariff per patient [OR if tariffs not applicable to your region what is the  
21 approximate annual cost of running the outpatient service]?

22   
23  
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25

26 \* 52. Where is the follow-up service located?

- 27  Dedicated hospital outpatient area  
28  Adapted space within critical care  
29  Other area within the hospital  
30  Community site  
31  Other (please specify)  
32  
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40 \* 53. How many clinic rooms are required to deliver the service? (Number and any other comments)

41   
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46 \* 54. If the patient is assessed by multiple healthcare professionals, do these encounters happen...

- 47  Together (i.e. all healthcare professionals in the same room)  
48  Separately (i.e. healthcare professionals in different rooms)  
49  
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1 \* 55. On average, what is the overall duration of a 'New' patient's appointment?  
2

- 3  <30 minutes  2 – 2.5 hours  
4  30 minutes – 1 hour  2.5 – 3 hours  
5  1 - 1.5 hours  >3 hours  
6  1.5 – 2 hours  
7  Other (please specify)  
8  
9  
10

11   
12

13  
14 \* 56. On average, what is the overall duration of a subsequent 'Follow up' patient's appointment?  
15

- 16  <30 minutes  2 – 2.5 hours  
17  30 minutes – 1 hour  2.5 – 3 hours  
18  1 - 1.5 hours  >3 hours  
19  1.5 – 2 hours  
20  Other (please specify)  
21  
22  
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27  
28 \* 57. What is the maximum number of visits patients can have?  
29

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\* 58. What interventions are typically delivered in your outpatient follow-up service? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Physical function assessment                      | <input type="checkbox"/> Family/Caregiver needs assessment                 |
| <input type="checkbox"/> Physiotherapy referral if required                | <input type="checkbox"/> Employment/occupation review                      |
| <input type="checkbox"/> Cardiac/respiratory/exercise referral if required | <input type="checkbox"/> Assessment of financial status                    |
| <input type="checkbox"/> Occupational function assessment                  | <input type="checkbox"/> Social needs assessment                           |
| <input type="checkbox"/> Occupational Therapy referral if required         | <input type="checkbox"/> Review of goals and preferences of care           |
| <input type="checkbox"/> Psychiatric assessment                            | <input type="checkbox"/> Review of ICU history and ICU events with patient |
| <input type="checkbox"/> Psychological assessment                          | <input type="checkbox"/> Patient visit to ICU                              |
| <input type="checkbox"/> Clinical psychology referral if required          | <input type="checkbox"/> Return/review of ICU diary                        |
| <input type="checkbox"/> Cognitive assessment                              | <input type="checkbox"/> Assessment of sexual function                     |
| <input type="checkbox"/> Nutritional assessment                            | <input type="checkbox"/> Assessment of sleep                               |
| <input type="checkbox"/> Dietitian referral if required                    | <input type="checkbox"/> Travel assessment e.g. driving, airline flight    |
| <input type="checkbox"/> Speech and language assessment                    | <input type="checkbox"/> Vital signs/observations                          |
| <input type="checkbox"/> Speech and Language Therapy referral if required  | <input type="checkbox"/> Physical examination                              |
| <input type="checkbox"/> Pharmacy review                                   | <input type="checkbox"/> Immunisation review                               |
| <input type="checkbox"/> Lifestyle/risk factor review                      |  |
| <input type="checkbox"/> Other (please specify)                            |  |

1 \* 59. For the following domains, please give the name of any validated outcome measure(s) or tool(s) used in  
2 your service, if any? Where able please explain why the measure has been chosen/implemented?  
3

4 Anxiety

5 Depression

6 Post-traumatic stress  
7 disorder

8 Sleep quality

9 Sleep apnoea

10 Cognition

11 Health-related quality of  
12 life

13 Personal Activities of Daily  
14 Living

15 Pain

16 Breathlessness

17 Palliative care needs

18 Sexual function

19 Nutritional status

20 Physical function

21 Exercise capacity

22 Disability

23 Frailty

24 Dependency

25 Socioeconomic status

26 Pharmacological risk

27 Alcohol intake

28 Smoking status

29 Driving status

30 Flying status

31 Additional Comments

1 \* 60. Do you use a screening tool for post intensive care issues?  
2  
3

4  Yes  
5

6  No

7 If Yes please describe briefly  
8  
9

10   
11

12 \* 61. Describe the major challenges delivering and sustaining this outpatient adult critical care recovery  
13 service?  
14

15  Time

Managerial engagement

17  Funding

Staff engagement

19  Personnel

Perceived value or priority

21  Space

Pressures from other services

23  Other (please specify)  
24

25   
26  
27

28 \* 62. To what extent do you agree that your current outpatient service meets the needs of your casemix?  
29

30  Strongly agree

31  Agree

32  Neither agree or disagree

33  Disagree

34  Strongly disagree  
35  
36  
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40 \* 63. What is lacking to make it fully fit for purpose?  
41

42  Physical space

43  Increased personnel

44  Commissioned funding

45  Administrative support

46  Other (please specify)  
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1 \* 64. To what extent do you agree that your existing funding/venue/staff/resource/service model is sustainable  
2 over next 5 years?

- 3  Strongly agree  
4  
5  Agree  
6  
7  Neither agree or disagree  
8  
9  Disagree  
10  
11  Strongly disagree  
12

13  
14 \* 65. What would help with sustaining the service?

- 15  Physical space  
16  
17  Increased personnel  
18  
19  Commissioned funding  
20  
21  Administrative support  
22  
23  Other (please specify)

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 6: Links and Future Plans - All Respondents

\* 66. Please tell us about any links or collaborations between your adult critical care service and recovery/follow-up services in neighbouring institutions (e.g. informal links for advice, formal hub and spoke network, established referral pathways etc)?

\* 67. Please tell us about any links you have established between your critical care services and the primary care interface or community interface?

\* 68. Please tell us about any links between your adult service and services for paediatric patients; adolescent patients; and those transitioning to adult services?

\* 69. Please tell us about any links with services for the care of the older person?

\* 70. What is being planned in your institution in terms of instigation, development, or expansion of adult critical care recovery services in the next 2-5 years?



1 \* 71. If you previously answered that you DO NOT offer any recovery and follow up services for adult critically ill  
2 patients within your Trust/institution, please could you give the main reasons for this? (Tick all that apply)

- 3  Lack of sufficient staff numbers  Insufficient patient numbers to justify
- 4  Lack of suitably trained staff  Not sure what to include in a service
- 5  Lack of available space/venue  Resources prioritised to other patient groups/clinical areas
- 6  No evidence to suggest benefit  Extra-contractual (out-of-area) patient caseload
- 7  Lack of funding  Not applicable - service are available
- 8  Not considered required service at managerial level
- 9  Other (please specify)

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20 \* 72. Do you have any web-based links / sites / information resources for recovering critical care patients and  
21 caregivers?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 7: Peer Support after Critical Illness

\* 73. Do you offer peer support services for adult critical care patients/relatives?

Yes

No

\* 74. What format does this peer support take?

Community or hospital-based support group meetings after discharge

Psychologist-led outpatient groups

Peer support based within ICU follow-up clinics

Online peer support

Groups based within the ICU

Peer mentor led

Other (please specify)

\* 75. How many times per year does this peer support occur?

\* 76. What is the average attendance of former patients?

\* 77. What is the average attendance of relatives/caregivers?

1 \* 78. What is the staffing input into these groups? (Tick all that apply)

- 2  None/peer-facilitated only
- 3
- 4  Critical care nurse
- 5
- 6  Intensivist
- 7
- 8  AHP
- 9
- 10  Psychologist
- 11  Other (please specify)
- 12

13

14

15

16 \* 79. What is the format of the peer support session?

- 17
- 18  Structured agenda with talks/presentations
- 19
- 20  Therapy session
- 21
- 22  Facilitated discussion
- 23
- 24  Informal meeting
- 25
- 26  Drop in
- 27
- 28  Virtual
- 29  Other (please specify)
- 30

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34 \* 80. Is your peer support programme affiliated to any networks, for example ICU Steps or Society of Critical  
35 Care Medicine Thrive Initiative?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 8: Physical rehabilitation programmes after hospital discharge

\* 81. Do you provide a physical rehabilitation programme post hospital discharge specifically for post critical illness patients as part of *routine* clinical practice? (separate to generic services such as intermediate care, supported discharge, hospital-at-home or similar)

Yes

No

\* 82. Who is responsible for leading this rehabilitation programme? (Tick all that apply)

Exercise/sports Therapist

Occupational Therapist

Doctor

Physiotherapist

Nurse

Rehabilitation Medicine specialist

Other (please specify)

\* 83. Is this healthcare professional...

ICU specialist

Rehabilitation specialist

1 \* 84. How do you select patients for inclusion into the programme? (Tick all that apply, and give details of any  
 2 assessment measures if applicable in the comments section)

- 3  Duration of mechanical ventilation in ICU  Health-related quality of life at ICU discharge  
 4  Duration of ICU admission  Physical function at hospital discharge  
 5  Duration of hospital admission  Muscle strength at hospital discharge  
 6  Physical function at ICU discharge  Exercise capacity at hospital discharge  
 7  Muscle strength at ICU discharge  Health-related quality of life at hospital discharge  
 8  Exercise capacity at ICU discharge  Not applicable – all post critical care patients are eligible  
 9  Other (please specify)

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23 \* 85. Where does the patient receive the majority of the intervention?

- 24  Home-based  
 25  Hospital-based  
 26  Community-based  
 27  Other (please specify)

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36 \* 86. Do you use telehealth or other interactive forms of intervention delivery?

- 37  Yes  
 38  No

39 If YES, please give details

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50 \* 87. Does your rehabilitation programme include an exercise component?

- 51  Yes  
 52  No

## A UK wide survey of recovery and follow-up services following adult critical illness

\* 88. Do patients exercise:

- Under supervision
- Independently
- Combination
- Other (please specify)

\* 89. Do patients exercise in a:

- Pre-determined circuit
- Patient-specific plan
- Other (please specify)

\* 90. What exercises are included (Tick all that apply)?

- Cardiovascular e.g. step-ups, treadmill, bike
- Strength e.g. lower limb, upper limb, free weights
- Balance e.g. static, dynamic
- Functional e.g. sit-to-stand, walking
- Other (Please specify)

\* 91. How are these exercises prescribed? (Tick all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Results of walking tests                | <input type="checkbox"/> Target heart rate  |
| <input type="checkbox"/> Results of balance assessment           | <input type="checkbox"/> Target level of exertion e.g. Borg scale (please specify range in Other section) |
| <input type="checkbox"/> Results of physical function assessment | <input type="checkbox"/> Clinician judgement  |
| <input type="checkbox"/> Repetition maximum principle            |   |
| <input type="checkbox"/> Other (please specify)                  |   |

\* 92. How do you monitor and/or progress exercise intensity during the exercise session? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Heart rate targets                | <input type="checkbox"/> Clinical observation/judgement of patient |
| <input type="checkbox"/> SpO2                              | <input type="checkbox"/> Patient verbal feedback                   |
| <input type="checkbox"/> Level of exertion e.g. Borg scale | <input type="checkbox"/> No formal monitoring                      |
| <input type="checkbox"/> Visual analogue scale             | <input type="checkbox"/> Reassessment of baseline measures         |
| <input type="checkbox"/> Other (please specify)            |  |

\* 93. In your programme, do you use an accompanying rehabilitation or exercise manual?

- Yes
- No

\* 94. Is your programme:

A stand-alone programme  
for post critical illness  
patients

Part of existing  
rehabilitation services  
including patients with  
other disease groups, if so  
which

Other (please specify)

1 \* 95. At what time point post hospital discharge does the programme commence:  
2  
3

- 4  Immediately post hospital discharge  One month post hospital discharge  
5  One week post hospital discharge  2-3 months post hospital discharge  
6  Two weeks post hospital discharge  
7  Other (please specify)  
8

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13 \* 96. Does your service have a waiting list?

- 14  Yes  
15  
16  No  
17

18 If Yes, how long?

19

20  
21  
22  
23 \* 97. Does your service have sufficient capacity to meet demand?

- 24  Yes  
25  
26  No  
27

28  
29 \* 98. How many sessions are in the rehabilitation programme?  
30

31

32  
33  
34 \* 99. How often are the sessions?

- 35  Weekly  
36  
37  Twice-weekly  
38  
39  Fortnightly  
40  
41  Other (please specify)  
42

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45  
46 \* 100. How long is each session?

- 47  30 minutes  
48  
49  45 minutes  
50  
51  1 hour  
52  
53  Other (please specify)  
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\* 101. Is this a:

- Rolling programme
- Stand alone

Additional Comments

\* 102. How many patients are in the group?

\* 103. What is the staff:patient ratio?

\* 104. Does your physical rehabilitation programme include an education component?

- Yes
- No



A UK wide survey of recovery and follow-up services following adult critical illness

\* 105. What topics are included (and list which MDT members delivers them)

Exercise	<input type="text"/>
Stress management	<input type="text"/>
Nutrition	<input type="text"/>
Return to work	<input type="text"/>
Energy conservation	<input type="text"/>
Medications	<input type="text"/>
What to expect of recovery	<input type="text"/>
Motivational coaching/training	<input type="text"/>
Other (please specify)	<input type="text"/>

\* 106. What outcome measures do you use with patients participating in your rehabilitation programme?

Please specify detail...

Strength-based e.g. repetition maximum	<input type="text"/>
Exercise capacity e.g. field walking tests (e.g. 6 Minute Walk Test, cardiopulmonary exercise testing (VO2max)	<input type="text"/>
Health-related quality of life e.g. SF-36 survey, Hospital Anxiety and Depression scale	<input type="text"/>
Mental/cognitive assessment e.g. Montreal Cognitive Assessment	<input type="text"/>
Functional performance e.g. Timed Up and Go, Short Physical Performance Battery	<input type="text"/>
Other (please specify)	<input type="text"/>

1 \* 107. Do you refer ICU patients routinely into other rehabilitation programmes/services, either in-patient or  
2 community-based?  
3

4  Yes

5  No  
6  
7

8 \* 108. If YES.... which type? (Tick all that apply)  
9

10  Pulmonary rehabilitation

11  Cardiac rehabilitation

12  Exercise on prescription (or similar)

13  Community gym sessions

14  Other (please specify)  
15  
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22 109. Any other comments regarding your post critical illness physical rehabilitation programme?  
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## A UK wide survey of recovery and follow-up services following adult critical illness

\* 110. Please indicate the barriers to delivering a post hospital discharge physical rehabilitation programme (Tick all that apply)

- |   |   |
|---|---|
| <input type="checkbox"/> Lack of funding  | <input type="checkbox"/> Extracontractual (out of area) patient caseload              |
| <input type="checkbox"/> Lack of sufficient staff                                     | <input type="checkbox"/> Lack of trained staff  |
| <input type="checkbox"/> Resources prioritised to other patient groups/clinical areas | <input type="checkbox"/> No evidence to demonstrate rationale/requirement for service |
| <input type="checkbox"/> Not considered required service at managerial level          | <input type="checkbox"/> Not sure what content to include in a programme              |
| <input type="checkbox"/> Lack of available space                                      | <input type="checkbox"/> Time constraints   |
| <input type="checkbox"/> Insufficient patient numbers to justify                      |   |
| <input type="checkbox"/> Other (please specify)                                       |   |

111. From the list above, please indicate the MAIN barrier that applies



A UK wide survey of recovery and follow-up services following adult critical illness

Impact of COVID-19 on recovery and follow-up services following critical illness

\* 112. Please tell us of any changes to existing services, if applicable, or development of any new services, as a result of COVID-19; for example in relation to timing, structure, format, and content, of delivery, the number of healthcare professionals involved etc



## A UK wide survey of recovery and follow-up services following adult critical illness

### End of survey

Thank you for completing this survey and once again if you have any questions relating to the survey or its completion, please contact:

Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)

Dr. Joel Meyer (Joel.Meyer@gstt.nhs.uk)

1  
2  
3 1 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
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5 2 **cross-sectional survey and progress report**  
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8 3

9 4 **Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams, Ceri Battle, Jo McPeake, Tara Quasim,**  
10 5 **Jon Silversides, Andrew Slack<sup>5</sup>, Carl Waldmann, Elizabeth Wilson, Joel Meyer<sup>5</sup> on behalf of the**  
11 6 **Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
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16 8 **ONLINE DATA SUPPLEMENT**  
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21 11 **E1. Discharge process from critical care to hospital ward**  
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23 12 The discharge process for patients transferring from critical care to the hospital ward is a written  
24 13 handover in 90.9% (n=160/176) of institutions, commonly accompanied by telephone (n=120/176,  
25 14 68.2%) or face-to-face (n=118/176, 67.0%) handover. Domains contained within the handover  
26 15 document include nursing (n=174/176, 98.9%), medical (n=167/176, 94.9%), physical rehabilitation  
27 16 (n=145/176, 82.4%), nutritional management (n=141/176, 80.1%), medicines' reconciliation  
28 17 (n=121/176, 68.8%), and speech and language therapy plan (n=102/176, 58.0). In the majority of cases  
29 18 (n=157/176, 89.2%) respondents reported using more than one delivery process for patients, with  
30 19 either paper (n=79/176, 44.9%), digital (n=35/176, 19.9%), or both (n=62/176, 35.2%) forms of  
31 20 delivery used. Less frequently reported components of handover included psychology/cognitive  
32 21 rehabilitation (n=49/176, n=27.8%) and occupational therapy (n=44/176, 25.0%). Other reported  
33 22 content (n=11/176, 6.3%) included outreach liaison, social work, and any specific individual aspects of  
34 23 care. A critical care discharge summary is sent to patients' primary care physician in 74 (/176, 42.0%)  
35 24 of institutions.  
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## E2. Inpatient recovery and follow-up services

Of 127 targeted inpatient recovery and follow-up services, most were led by nursing staff (n=65/127, 51.2%, n=4 missing responses), with just over one quarter led by the multi-professional team (n=36/127, 28.3%), and a small proportion by medics (n=16/127, 12.6%). Physiotherapists (n=3) and rehabilitation co-ordinators (n=1) were reported in a minority of cases (both /127,  $\leq 3.0\%$ ).

The most frequently reported professions missing from inpatient services were psychology (n=55/127, 43.3%), occupational therapy (n=29/127, 22.8%), and physical therapy (n=18/127, 14.2%). Other missing professions were reported as follows: Medical (n=11/127, 8.7%), speech and language therapy (n=11/127, 8.7%), dietetics (n=10/127, 7.9%), and in a minority of cases, nursing, psychiatry, rehabilitation assistants, social workers, pharmacists, cognitive behavioural therapy, occupation health, advanced critical care practitioners, and administrators (all  $\leq n=5/127, \leq 4.0\%$ ). Eleven and 2 respondents respectively reported the whole multi-professional team, and 'All allied health professionals' as missing from services. Twenty-three respondents (/127, 18.1%) reported that there were no professions missing from their services.



### 69 E3. Outpatient recovery and follow-up services

70 One hundred and thirty respondents (/176, 73.9%) reported providing outpatient (following hospital  
71 discharge) recovery and follow-up services for adult post critical illness patients. Additional reasons  
72 for excluding patients from services (all  $n \leq 3$  respondents) included: cardiothoracic/cardiology  
73 diagnoses, neurological diagnoses, dementia/cognitive impairment, diagnosis of an overdose,  
74 requiring home mechanical ventilation, residing out of geographical hospital area, discharged to a  
75 residential or nursing home, other specialist rehabilitation pathway in place, prisoners, elective  
76 surgery, aged >75 years, previous non-attendance. Whilst intensivist and nursing staff were the most  
77 frequently reported staff leading services, a small number of other professions/teams were detailed  
78 by respondents: joint intensivist and nurse ( $n=7$ ), multi-professional team ( $n=4$ ), joint intensivist and  
79 psychologist ( $n=2$ ), and physiotherapist, joint advanced critical care practitioner and physiotherapist,  
80 surgeon, joint intensivist and physiotherapist, and joint nurse and physiotherapist (all  $n=1$ ).

81  
82 The majority ( $n=108/130$ , 83.1%) of services involved 2 or more healthcare professions, with further  
83 breakdown according to number of healthcare professions involved; 1, ( $n=22$ ), 2 ( $n=41$ ), 3, ( $n=36$ ), 4  
84 ( $n=14$ ), 5 ( $n=7$ ), 6 ( $n=4$ ), 7 ( $n=4$ ), 8 ( $n=2$ ). Combinations of healthcare professions providing services  
85 are reported in Table E1. The most frequently reported professions missing from outpatient services  
86 were psychology ( $n=61/130$ , 46.9%), physiotherapy ( $n=45/130$ , 34.6%), occupational therapy  
87 ( $n=41/130$ , 31.5%), and dietetics and speech and language therapy (both  $n=22/130$ , 16.9%). Less  
88 frequently reported missing professions included intensive care medicine and pharmacy (both  
89  $n=11/130$ , 8.5%), social work ( $n=7/130$ , 5.4%). A minority of respondents reported psychiatry,  
90 administrative support, nursing, the multi-professional team, rehabilitation team, primary care  
91 physician, pain team, occupational health, counsellor, wellbeing services, and service improvement  
92 team, as professions missing from outpatient services (all  $n \leq 4/130$ ,  $\leq 3.1\%$ ). Clinic rooms available  
93 for services typically ranged 1-4. Subsequent appointments, after the initial one, typically ranged  
94 between 1 and 3, but some respondents reported no limits on the number of repeat visits patients  
95 could have.

96  
97 Seventy-six respondents (/130, 58.5%) reported using some form of screening tool for post intensive  
98 care issues; specifically named tools were not always provided but where they were these included  
99 the Chelsea Critical Care Physical Assessment Tool, Intensive Care Psychological Assessment Tool,  
100 Hospital Anxiety and Depression Scale, Post-Traumatic Stress Symptoms-14 scale, Short-Form 36.  
101 Where specific tools were not listed respondents reported use of their own locally developed  
102 proformas and concerns checklists, and rating scales (e.g. distress thermometer), and/or indicated the

1  
2  
3 103 broad domains they assessed e.g. activities of daily living, psychological status. Eight-five respondents  
4 104 gave examples of outcome measures or tools to assess aspects of critical illness recovery, which are  
5 105 summarised in Table E2.  
6  
7  
8 106

9  
10 107 Twelve (/130, 9.2%) respondents indicated they strongly agreed their current outpatient service met  
11 108 the needs of their local case-mix, 56 (/130, 43.1%) were in agreement, 21 (/130, 16.2%) neither agreed  
12 109 or disagreed, 34 (/130, 26.2%) were in disagreement, and 7 (/130, 5.4%) in strong disagreement.  
13 110 When asked whether existing service models (including funding, venue, staffing, resources) were  
14 111 sustainable for the next 5 years, 9 (/130, 6.9%) reported they strongly agreed, 46 (/130, 35.4%) agreed,  
15 112 32 (/130, 24.6%) neither agreed or disagreed, 36 (/130, 27.7%) disagreed, and 7 (/130, 5.4%) strongly  
16 113 disagreed. Increased personnel (n=103/130, 79.2%), commissioned funding (n=89/130, 68.5%),  
17 114 administrative support (n=74/130, 56.9%), and physical space for the service (n=56/130, 43.1%) were  
18 115 factors required to support services.  
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26 117 Additional factors reported to help sustain services over the next 5 years included better referral  
27 118 pathways, clear standards to guide services, greater medical engagement, enhanced links with  
28 119 primary care services, and improved profile of the service (all individually reported by one  
29 120 respondent).  
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137 **Table E1.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (n/130, %)
Timeframe for first follow-up	2-3 months after hospital discharge	102 (78.5)
	6 months after hospital discharge	8 (6.2)
	1 month after hospital discharge	6 (4.6)
	Other <sup>a</sup>	13 (10.0)
Number and combination of professions of clinicians involved <sup>b</sup>	1 clinician	22 (16.9)
	- Nurse	- 18
	- Intensivist	- 3
	- Physiotherapist	- 1
	2 clinicians	41 (31.5)
	- Nurse, Intensivist	- 29
	- Nurse, Physiotherapist	- 9
	- Intensivist, Physiotherapist	- 2
	- Intensivist, OT	- 1
	3 clinicians	36 (27.7)
- Nurse, Intensivist, Physiotherapist	- 19	
- Nurse, Intensivist, Psychologist	- 10	
- Nurse, Intensivist, OT	- 2	
- Intensivist, Physiotherapist, Psychologist	- 2	
- Nurse, Intensivist, Psychiatrist	- 1	
- Nurse, Physiotherapist, SLT	- 1	
- Nurse, Intensivist, GRA	- 1	
4 clinicians	14 (10.8)	
- Nurse, Intensivist, Physiotherapist, Psychologist	- 7	
- Nurse, Intensivist, Physiotherapist, OT	- 3	
- Nurse, Intensivist, Physiotherapist, Dietitian	- 2	
- Nurse, Physiotherapist, Psychologist, Dietitian	- 1	
- Nurse, Intensivist, Physiotherapist, Psychiatrist	- 1	
5 clinicians	7 (5.4)	
- Nurse, Intensivist, Physiotherapist, Psychologist, Pharmacist	- 4	
- Nurse, Intensivist, Physiotherapist, OT, SLT	- 1	
- Nurse, Intensivist, Physiotherapist, SLT, Dietitian	- 1	
- Nurse, Intensivist, Physiotherapist, OT, Psychologist	- 1	
6 clinicians	4 (3.1)	
- Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT	- 2	
- Nurse, Intensivist, Physiotherapist, Psychologist, Dietitian, Pharmacist	- 2	
7 clinicians	4 (3.1)	

	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT, Dietitian,	- 1
	- Nurse, Intensivist, Physiotherapist, Psychologist, SLT, Dietitian, Pharmacist	- 1
	- Nurse, Intensivist, Physiotherapist, Psychologist, SLT, Dietitian, GP	- 1
	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, SLT, Pharmacist	- 1
	8 clinicians	2 (1.5)
	- Nurse, Intensivist, Physiotherapist, OT, Psychologist, Psychiatrist, Dietitian, Pharmacist	- 2
Location of service delivery	Dedicated hospital outpatient area	83 (63.8)
	Adapted space within critical care	26 (20.0)
	Other area within the hospital	11 (8.5)
	Community site	6 (4.6)
	Other <sup>c</sup>	3 (2.3)
Format of assessment by multiple clinicians <sup>d</sup>	Together (i.e. all clinicians in the same room)	77 (59.2)
	Separately (i.e. clinicians in different rooms)	42 (32.3)

Abbreviations: OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner

Legend: <sup>a</sup>Other includes: 2 weeks, n=3, 2-4 weeks, n=1, 6 weeks, n=2, 3 months, n=1, 3-6 months, n=4, 4-5 months, n=1, 6-12, n=1. <sup>b</sup>Administrative support counted separately; 29 (22.3%) sites reported administrative support for outpatient service.

<sup>c</sup>Other includes: Multiple areas for service deliver, n=2, Other clinical outpatient area, n=1 (n=1 blank response). <sup>d</sup>n=11 missing responses.

162 **Table E2.** Examples of outcome measures or tools to assess aspects of post critical illness recovery in  
 163 outpatient services

Impairment	Examples of outcome measures/tools
Anxiety	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Generalised Anxiety Disorder Assessment; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Short Form-36
Depression	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Patient Health Questionnaire-9; Major ICD-10 Depression Inventory; Perceived Stress Questionnaire;
Post-traumatic stress disorder	Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; Trauma Screening Questionnaire; EuroQol-5Dimension; Impact of Events Scale-Revised; Primary Care Post Traumatic Stress Disorder Screen;
Sleep quality	Insomnia Severity Index; Pain and Sleep Questionnaire
Sleep apnoea	STOP-Bang Questionnaire
Cognition	Montreal Cognitive Assessment; Mini-Mental State Examination; 4AT test; Confusion Assessment Method for the ICU; Addenbrooke's Cognitive Examination-Revised;
Health-related quality of life	Short Form-36; EuroQol-5Dimension; Schwartz Outcomes Scale-10
Personal activities of daily living	Barthel Index; Self-efficacy Tool; Short Form-36
Pain	Verbal/numeric 0-10 rating scale; Brief Pain Inventory; Critical Care Pain Observation Tool;
Breathlessness	Borg scale; Modified Medical Research Council scale; RAND breathlessness scale; pulmonary function tests; chest x-ray
Palliative care needs	RAND Mental Health Inventory
Sexual function	Sexual Health Questionnaire
Nutritional status	Weight
Physical function	Functional Independence Measure + Functional Assessment Measure; Rivermead Mobility Index; ICU Mobility Scale; Barthel Index; Chelsea Critical Care Physical Assessment Tool; Physical Function in ICU Test; Handgrip dynamometry; Six Minute Walk Test; Berg Balance Scale; Sit-to-Stand test; Short-Form 36; EuroQol-5Dimension
Exercise capacity	Six Minute Walk Test; Borg scale; EuroQol-5Dimension; Chelsea Critical Care Physical Assessment Tool; Tinetti test; Metabolic equivalents
Disability	Chelsea Critical Care Physical Assessment Tool; EuroQol-5Dimension

Frailty	Rockwood Clinical Frailty Scale; Clinical Frailty Scale; EuroQol-5Dimension
Dependency	EuroQol-5Dimension; Post-Traumatic Stress Symptoms-14 scale
Socioeconomic status	EuroQol-5Dimension
Pharmacological risk	-
Alcohol intake	Unit-based calculation
Smoking status	Pack year history
Driving status	Referral to a local driving centre; reference to DVLA (Driver and Vehicle Licensing Agency) guidelines
Flying status	Reference to British Thoracic Society (UK) guidelines
Additional comments	<i>A number of respondents reported no use of specific tools, but thorough clinical assessment +/- use of a 'concerns checklist', or 'distress thermometer', to identify and rate problems.</i>

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#### 188 **E4. Links between recovery and follow-up services and other services**

189 Forty-three respondents (/176, 24.4%) reported no links between their recovery and follow-up  
190 services and any neighbouring institutions, networks, or other referral pathways.

191

192 Remaining respondents (133/176, 75.6%) reported examples of links between their own services, and  
193 other similar services in neighbouring institutions, summarised into 8 categories: i) informal links into  
194 critical care networks including knowledge and best practice sharing (n=67/176, 38.1%), ii) linking to  
195 community service pathways e.g. pulmonary rehabilitation, psychology (n=27/176, 15.3%), iii)  
196 informal referrals made to neighbouring centres (n=20/176, 11.4%), iv) coordination with other  
197 specialty clinics e.g. respiratory, trauma, neurosciences (n=19/176, 10.8%), v) formal referrals made  
198 to neighbouring centres (n=10/176, 6.0%), vi) peer support referral (n=9/176, 5.1%), vii) formal  
199 referrals accepted from neighbouring centres (n=8/176, 4.5%), and viii) informal referrals accepted  
200 from neighbouring centres (n=6/176, 3.4%).

201

202 Examples given by respondents where links were present (87/176, 49.4%) between their  
203 recovery/follow-up services and primary care and/or community interfaces, were summarised into 8  
204 categories: i) referral to community therapy services (n=27/176, 15.3%), ii) patient letter sent routinely  
205 to primary care physician (n=26/176, 14.8%), iii) ad hoc contact with primary care physician (n=16/176,  
206 9.1%), iv) post critical illness information provided to primary care physician (n=15/176, 8.5%), v)  
207 signposting to community citizens advice and employment services support (n=11/176, 6.3%), vi)  
208 referral to community independent exercise programmes (n=9/176, 5.1%), vii) referral to community  
209 independent psychology services (n=8/176, 4.5%), viii) support for residential ventilation care  
210 (n=2/176, 1.1%). Eighty-nine respondents (/176, 50.6%) indicated that there were no links available  
211 with primary/community care sectors.

212

213 Around three-quarters of respondents indicated no links between their (adult) recovery/follow-up  
214 services and services managing paediatric, adolescent, or transition-to-adult (n=135, 76.7%), or with  
215 services for care of older adults (n=131/176, 74.4%). For the former, a small number of respondents  
216 (n=24/176, 13.6%) reported ad hoc links with paediatric services, and a minority (n=7/176, 4.0%)  
217 reported available links with transition-to-adult services. For the latter, a small number of  
218 respondents (n=23/176, 13.1%) indicated some ad hoc links with services during the inpatient stage  
219 of recovery, and a minority indicated links with community services (n=10/176, 5.7%) and older person  
220 psychiatric service (n=3/176, 1.7%).

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3 222 **E5. Peer support after critical illness**  
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5 223 Additional forms of peer support offered included: composite involving multiple options of delivery,  
6 224 visits from former patients, and a peer-mentor led group (all reported by one respondent each).  
7  
8 225 Furthermore, one respondent indicated their service was currently under active development, and  
9  
10 226 detail was not reported by one respondent.  
11

12 227

13 228 Three services were peer-facilitated only, and one other service involved former patients and families.  
14  
15 229 Other staffing was reported very infrequently (ranging 1-3 occasions); chaplaincy, critical care  
16  
17 230 outreach staff, counselling staff, advanced critical care practitioners, social work, pharmacy,  
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19 231 administrative staff, and ICU volunteers.  
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## 256 **E6. Post hospital discharge physical rehabilitation programmes**

257 Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31  
258 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26/31, 83.9%),  
259 or in combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or  
260 rehabilitation assistant (all n=1/31, 3.2%, each). One programme was led by an exercise/sports  
261 therapist. Clinicians leading programmes were either ICU-specialist (n=19/31, 61.3%) or  
262 rehabilitation-specialist (n=12/31, 38.7%). Physical rehabilitation programmes were primarily  
263 hospital-based (n=22/31, 71.0%), with some community-based (n=5/31, 16.1%), home-based (n=2/31,  
264 6.5%), and combination (home and community, n=2/31, 6.5%) delivery. Telehealth (or other  
265 interactive forms of intervention delivery) was used by only one respondent. Three-quarters of  
266 programmes were stand-alone (n=23/31, 74.2%), but a small number of respondents reported  
267 programmes were integrated with other disease-specific rehabilitation services n=5/31, 16.1%).  
268 Eighteen programmes (/31, 58.1%) were rolling programmes i.e. patients could enter the programme  
269 at any point, as opposed to part of a discrete cohort. Programmes were generally well serviced with  
270 no waiting list (n=23/31, 74.2%) and capacity to meet need (n=23/31, 74.2%). Further features of  
271 physical rehabilitation programmes are summarised in Table E3.

272  
273 All but one programme included an exercise component (n=30/31, 96.8%), albeit no further responses  
274 were provided by one respondent to detail their programme further. For the remaining respondents  
275 (n=29), features of the exercise component of their physical rehabilitation programme are reported  
276 in Table E4.

277  
278 Barriers to the delivery of post hospital discharge physical rehabilitation programmes are summarised  
279 in Table E5. These were reported by both respondents who did, and did not, offer a service. Lack of  
280 funding was both the most frequently reported barrier (n=128,176 72.7%) as well as the main barrier  
281 reported (n=86/176, 48.9%). Lack of sufficient staff was the second most frequent (n=116/176,  
282 65.9%), and main (n=28/176, 15.9%), barrier.

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290 **Table E3.** Features of physical rehabilitation programmes

Feature	Options	Occurrence (/31, (n, %))
Timepoint post hospital discharge that programme commences*	Immediately post hospital discharge	8 (25.8)
	2-3 months post hospital discharge	7 (22.6)
	Other – individualised per patient	5 (16.1)
	1 month post hospital discharge	3 (9.7)
	4-6 weeks post hospital discharge	2 (6.5)
	2 weeks post hospital discharge	2 (6.5)
Assessment criteria for patient inclusion~	Duration of ICU admission	22 (71.0)
	Duration of mechanical ventilation during ICU	17 (54.8)
	Physical function at ICU discharge	9 (29.0)
	Muscle strength at ICU discharge	9 (29.0)
	Exercise capacity at ICU discharge	9 (29.0)
	Physical function at hospital discharge	7 (22.6)
	Duration of hospital admission	5 (16.1)
	Muscle strength at hospital discharge	5 (16.1)
	Health-related quality of life at ICU discharge	4 (12.9)
	Exercise capacity at hospital discharge	4 (12.9)
Session details <sup>a</sup>	Weekly	20 (64.5)
	Twice-weekly	3 (9.7)
	Individualised per patient	3 (9.7)
	Fortnightly	2 (6.5)
	<i>Number of sessions (median (IQR))</i>	6 (5.5-9.0)
Duration of sessions <sup>a</sup>	1 hour	15 (48.4)
	30 minutes	6 (19.4)
	Individualised	5 (16.1)
	45 minutes	2 (6.5)
Number of patients attending a session ( <i>open-ended question</i> )	Responses variable, ranging from individual patients (if a home-based programme or 1:1 format), to up to 20 in a group. Examples reported include 4-8, 6-8, average 6, up to 12, 8-10, 8-15	-
Staff: patient ratio ( <i>open-ended question</i> )	Responses variable; examples include 1:1, 1:3, 1:4, 1:5-6, 2:8, 2:6, 2:12; staff could be qualified or a combination of qualified and assistant	-
Education topics, and members of the MDT involved <sup>b</sup>	Yes	22 (71.0)
	No	6 (19.4)
	Exercise	18 (58.1)
	- PT, Nurse, Medic, PTA	17 (54.8)
	Recovery expectations	17 (54.8)

	<ul style="list-style-type: none"> <li>- PT, Nurse, MDT, Medic</li> </ul> Energy conservation	16 (51.6)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA, OT, Independent</li> </ul> Nutrition	13 (41.9)
	<ul style="list-style-type: none"> <li>- PT, DT, Nurse, Medic, MDT</li> </ul> Return to work	12 (38.7)
	<ul style="list-style-type: none"> <li>- PT, Medic, Nurse, OT, Vocational Specialist</li> </ul> Medications	11 (35.5)
	<ul style="list-style-type: none"> <li>- Medic, Nurse, PT, Pharmacist</li> </ul> Motivational training	11 (35.5)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA</li> </ul> Stress management	9 (29.0)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, OT, Medic</li> </ul> Other e.g. falls management, breathing control, mindfulness, individualised needs, goal-setting	5 (16.1)
Use of outcomes and examples of outcome measures <sup>c</sup>	Strength assessment	14 (45.2)
	<ul style="list-style-type: none"> <li>- Quadriceps strength, handgrip strength, repetition count, CPAX</li> </ul> Exercise capacity	17 (54.8)
	<ul style="list-style-type: none"> <li>- Walking tests (6MWT, ISWT), Timed Up and Go, CPEX</li> </ul> Health-related quality of life	18 (58.1)
	<ul style="list-style-type: none"> <li>- HADS, EQ-5D, SF-36</li> </ul> Cognitive/Mental health	2 (6.5)
	<ul style="list-style-type: none"> <li>- Readiness for return to work</li> </ul> Function	7 (22.6)
Onwards referral to other rehabilitation programmes <sup>d</sup>	Yes	20 (64.5)
	No	7 (22.6)
	Pulmonary rehabilitation	16 (51.6)
	Cardiac rehabilitation	15 (48.4)
	Community gym session	14 (45.2)
	Exercise on prescription (or similar community exercise/walking programme)	6 (19.4)

291 *Abbreviations:* ICU = intensive care unit; PT = physiotherapist; PTA = physiotherapy assistant; OT = occupational therapist;  
 292 DT = dietitian; MDT = multidisciplinary team; CPAX = Chelsea Critical Care Physical Assessment Tool; 6MWT = Six Minute Walk  
 293 Test<sup>1</sup> ISWT = Incremental Shuttle Walk Test; CPEX = cardiopulmonary exercise test; HADS = Hospital Anxiety and Depression  
 294 Scale; EQ-5D = Euroqol-5 Dimension; SF-36 = Short-Form 36; NEADL = Nottingham Extended Activities of Daily Living; SPPB =  
 295 Short Physical Performance Battery.

296 *Legend:* Respondents could choose more than one option from multiple response-option questions. \*Two respondents  
 297 reported uncertainty on time-frame for programme commencement, one respondent reported it commenced after  
 298 attendance at local follow-up programme, and one respondent did not report. ~Four respondents reported aspects of  
 299 individual patient assessment by clinicians for appropriateness, and may be dependent on underlying diagnosis and/or  
 300 ongoing rehabilitation requirements. One respondent reported inclusion was based on assessment after attendance at local  
 301 follow-up programme. One respondent expanded on the use of the Chelsea Physical Assessment Tool and the Intensive Care  
 302 Psychological Assessment Tool as assessment measures for applicable criteria. <sup>a</sup>Three non-responses. <sup>b</sup>Eleven non-  
 303 responses. <sup>c</sup>Seven non-responses. <sup>d</sup>Four non-responses.

306 **Table E4.** Features of exercise components of physical rehabilitation programmes

Feature	Options	Occurrence (/29, (n, %))
Approach to patient exercise	Under supervision	15 (51.7)
	Independently	2 (6.9)
	Combination of aforementioned	11 (37.9)
	Dependent on individual patient	1 (3.4)
Design of exercise component	Patient-specific plan	17 (58.6)
	Pre-determined circuit	10 (34.5)
	Combination of aforementioned	2 (6.9)
Type of exercise included*	Strength	28 (96.6)
	Functional	26 (89.7)
	Cardiovascular	25 (86.2)
	Balance	23 (79.3)
Approach to exercise prescription~	Clinician judgement	23 (79.3)
	Results of physical function assessment	17 (58.6)
	Target level of exertion	13 (44.8)
	Results of walking tests	11 (37.9)
	Results of balance assessment	7 (24.1)
	Repetition maximum principle	4 (13.8)
Approach to exercise monitoring and progression#	Clinical observation of patient	20 (69.0)
	Patient verbal feedback	20 (69.0)
	Level of exertion	17 (58.6)
	Oxygen saturation level	10 (34.5)
	Reassessment of baseline measures	10 (34.5)
	Heart rate targets	9 (31.0)
	Visual analogue scale	2 (6.9)
	No formal monitoring	1 (3.4)
Accompanying rehabilitation or exercise manual	Yes	15 (51.7)
	No	14 (48.3)

307 *Abbreviations:* ICU = intensive care unit

308 *Legend:* \*Strength exercise e.g. lower limb, upper limb, free weights; Functional exercise e.g. sit-to-stand, walking;  
 309 Cardiovascular exercise e.g. step-up, treadmill, cycling; Balance exercise e.g. static, dynamic; 2 respondents reported also  
 310 including work-based movement pattern exercise. ~In addition to the response options, one respondent also indicated use  
 311 of a local graded exercise system incorporating 3 levels at each exercise station depending on individual patient ability. #3  
 312 respondents reported uncertainty as to detail of approach.

323 **Table E5.** Barriers to the delivery of post hospital discharge physical rehabilitation programmes

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Barrier	Occurrence overall (n/176, %)	Occurrence as main barrier (n/176, %)
Lack of funding	128 (72.7)	86 (48.9)
Lack of sufficient staff	116 (65.9)	28 (15.9)
Resources prioritised to other patient groups/clinical areas	82 (46.6)	8 (4.5)
Not considered required service at managerial level	70 (39.8)	12 (6.8)
Lack of available space	70 (39.8)	4 (2.3)
Time constraints	49 (27.8)	5 (2.8)
Lack of trained staff	34 (19.3)	1 (0.6)
Not sure what content to include in a programme	30 (17.0)	0
No evidence to demonstrate rationale/requirement for service	25 (14.2)	3 (1.7)
Extracontractual (out of area) patient caseload	18 (10.2)	1 (0.6)
Insufficient patient numbers to justify	13 (7.4)	2 (1.1)
Other*	13 (7.4)	11 (6.3)

325 Missing responses, n=23 (overall), n=43 (main).

326 *Legend:* \*Other (overall) = Lack of patient motivation, n=3; no staff willing/motivated to run service, n=3; never considered  
 327 as a service previously, n=2; significantly large rural catchment area of hospital, n=1; lack of patient facilities e.g. transport,  
 328 parking, n=1; local referral pathways to physiotherapy services already in place, n=1; rehabilitation the responsibility of the  
 329 admitting clinical specialty, n=1; onset of the COVID-19 pandemic, n=1. Other (main) = no staff willing/motivated to run  
 330 service, n=3; non-commissioned service, n=1; no time to develop service, n=1; lack of patient motivation, n=1; onset of the  
 331 COVID-19 pandemic, n=1; patient moved from acute setting, n=1; patient heterogeneity limiting standardised service, n=1;  
 332 other rehabilitation service available to refer into, n=1; no single main barrier (all options apply), n=1.

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348 **E7. Impact of COVID-19 on recovery and follow-up services following critical illness**

349 Summative content analysis{ ADDIN EN.CITE  
 350 <EndNote><Cite><Author>Hsieh</Author><Year>2005</Year><RecNum>47634</RecNum><Display  
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 357 title></titles><periodical><full-title>Qualitative Health Research</full-title><abbr-1>Qual. Health  
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 361 care</keyword></keywords><dates><year>2005</year></dates><accession-  
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 364 urls></urls><electronic-resource-num>10.1177/1049732305276687</electronic-resource-  
 365 num></record></Cite></EndNote>} was used to review and identify themes from respondents' free

366 text responses detailing the impact of the COVID-19 pandemic on their services e.g. any changes to  
 367 existing services, if applicable, or the development of any new services. Table E6 presents the themes  
 368 generated, and the frequency with which they featured across all responses. Table E7 reports the  
 369 narrative free text responses with accompanying thematic coding.

371 **Table E6.** Themes describing changes to services as an impact of COVID-19 pandemic

Theme	Letter denoting theme	Frequency of occurrence (/162) (n, %)
No change to service	a	17 (10.5)
Applying for funds/new service as an impetus/response	b	44 (27.2)
Research about follow-up initiated	c	1 (0.6)
New service implemented: telephone based	d	14 (8.6)
New service implemented: face to face	e	16 (9.9)
New service implemented: virtual	f	12 (7.4)
New service implemented: exercise	g	15 (9.3)
Increased capacity/activity of existing service	h	40 (24.7)

Decreased capacity/activity of existing service	i	48 (29.6)
Increased frequency of existing service	j	20 (12.3)
Existing service conversion to telephone	k	30 (18.5)
Existing service conversion to virtual	l	44 (27.2)
Shortened review interval compared to previous	m	11 (6.8)
Addition of psychologist to service	n	6 (3.7)
Follow-up combined with respiratory medicine services	o	20 (12.3)

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For peer review only



**Table E7.** Narrative free text responses with accompanying thematic coding (with reference to Table E6)

Free text response*	Themes
We have performed telephone triage of all patients within a week of discharge and have then provided an MDT zoom clinic, each patient assessed for 30 mins with further follow up phone calls/ongoing referrals made (all patients have ongoing needs and will receive further follow up, our patient support group is virtual, we have started an exercise class and now have links to an exercise class run by the respiratory team for pulmonary fibrosis). We still have no psychologist though have funding for this service#	d, g, l, n, o
Business case being rewritten	b
Our Follow Up team had been pulled to work clinically on ITU during Covid 19. Currently one member now back to doing follow up. Limited in hospital follow up has occurred due to infection risk in different ward locations. Outpatient clinic follow up being done virtually using video technology#	i, l
More frequent follow up clinics, more exercises based reviews for discharge. We would love some psychology input	g, h, j, n
Currently the rehab role is 18.5hrs for the clinical nurse specialist, this is being increased 37.5 for 8 weeks due to increased patient numbers. No other services hours have been increased	h
Currently have an intensivist running clinic and doing more patient assessments and tests. Running 5 physio rehab classes a week on line with support group. Post ICU ward visits taking much longer. Telephone consultations have increased	g, h, j
Follow-up service is now online	l
Awaiting response to business case for dedicated follow up funding	b
Services have been delayed as needed to work clinically. We are looking at trying to get funding to provide rehab sessions post discharge.	b, i
No outpatients since start of covid, now setting up video conference for non covid patients and outpatient appointments for covid patients with further physical examination and other clinician input.	i, l
Plans for physical rehabilitation programme whilst inpatient and following discharge, trying to obtain psychology input, formal payment from commissioners for follow up clinic	b, g, n
With COVID there is a much greater demand for all of these services. We are including all COVID level 2 and 3 patients on our post ICU pathway (including those having CPAP in non ICU areas), and ICU follow up clinic, we are only in the early stages of working out how we are going to deal with the increased work load. The patients are all receiving an earlier psychol review and cognitive assessment as an inpatient, and once at home an initial in depth 1:1 virtual rehab assessment with them and then will be invited to a virtual exercise class (increased to twice weekly from the usual once weekly) , with a link to access exercise videos in their own time. We have separated off the psychological and physical aspects of clinic - the former is done first, then the latter. There will need to be more sessions for ICU clinic. We are also linking in with the respiratory consultants, so as not to be duplicating workload as a result of their COVID BTS guidelines. This will all require increased resources, we are unsure where this will come from currently	b, g, h, l, m, o
Our therapists have visited each of our Covid admissions at home as part of a research study that we have devised and gained approval for. We also held a follow up Covid clinic with a respiratory physician, a physio and an OT.	c, e, o
Telephone contact not face to face	d
Use of online platforms for follow up, communication with relatives and discharged patients	l
Telephone follow up to discharged patients	k
Just setting up a multidisciplinary follow up clinic for covid patients and trying to expand that to all patients but not commissioned yet... Using modified pickups tool for screening	b
Covid-19 essentially stalled all non-pandemic business and delayed implementation. The loss of SPA time negatively impacted planning.	b, i



1	During COVID 19 the clinic was point on hold. Due to lockdown and the senior sister required to	i, l
2	work clinically. Since the lockdown the clinic has now been undertaken via telephone	
3	consultation. We have increased the service to two nurses to help "catch up"	
4		
5	This will have to be a "telephonic" clinic and I am not sure how effective it will be. The numbers	b, i, k
6	will be overwhelming and I am not sure as we have not yet commenced clinics at our hospital.	
7		
8	Face to face follow up clinic now telephone based Delay in getting x2 Rehabilitation therapy	i, l
9	assistant practitioners interviewed in March 2020 into post, Delay in being able to set up post	
10	ICU Support groups	
11	Have submitted business case for proper follow up service	b
12		
13	Increased clinic as we have a white worker calling patients from home	h, k
14	Step down rehabilitation ward created and patients received a lot of input from allied health	h, j, m
15	professionals to reduce length of stay. Increased hours for Follow Up clinic	
16	Physio involvement. Difficulty delivering Follow-up clinics	h, i
17	Not received OT funding. Availability of working at home. Clinic & rehab class now online.	b, g, i, l
18	Increased info available online. Timing delayed as Follow up role during pandemic paused as	
19	helping on unit.	
20	Usually 3 critical care follow-up nurses and 0.3 physiotherapist in follow-up (physiotherapy only	e, h
21	reviewed ward based patients needing assistance of 2 or more to transfer) - nil involvement in	
22	outpatient follow-up. During COVID physiotherapy now 1.0 equivalent - partaking in	
23	telecommunications with patients and MDT follow-up clinic. MDT follow up clinic due to be	
24	trialled this week (Consultant, nurse, physiotherapy, OT, SLT, dietician)	
25	New joint clinic with respiratory team for COVID ICU pts	e, h, o
26	Permanent loss of gym. Restrictions on group exercise. Limited staffing. Limited suitable	i
27	patients	
28	No	a
29	Impetus to develop follow-up services for critical care	b
30		
31	We have established a 6 week MDT to discuss patients after phone contact. Full MDT attendance	d, h
32	(physio, nurses, OT, psychology, dietitian, SLT, medic). All good will with no funding	
33	Implemented Nurse led follow up for all COVID-19 patients and general critical care patients	d, f, h
34	who have been on critical care for 4 days or longer	
35	Phone triage for follow up clinic	k
36	Outpatient clinics have been done via telephone rather than face to face. We haven't yet been	b, k
37	able to secure support to run the clinic via a virtual medium - although we are hoping to run	
38	clinics this way soon	
39	We have set up a COVID follow up service alongside the respiratory physicians. This involves a	b, d, e, h,
40	phone clinic to all patients admitted to hospital with COVID and those with ongoing resp needs	m, o
41	only are then seen face to face by resp alone, those with multimorbidity and post ITU issues are	
42	seen in an MDT. The MDT comprises of Critical care physician, respiratory physician, critical care	
43	physio, critical care OT, SLT, Specialist nurses for critical care and psychology. The clinic runs	
44	fortnightly and we see 6 patients face to face. The patients have lung function done on arrival.	
45	They are in clinic for 2.5-3 hours. The aim is a one stop assessment and they are referred onto	
46	other services such as musculoskeletal physio, dysfunctional breathing clinic, outpatient	
47	cognitive rehab etc. This is funded in part by emergency funds at the moment and a significant	
48	amount of goodwill. It will stop once the COVID patients are seen but we are hoping to use the	
49	information gained from this to set up a fully fledged critical care follow up service <sup>#</sup>	
50	All clinic activity halted other than phone calls	d, i
51	Our class is now running virtually with weekly phone calls, booklets and exercises sent to	g, k, l
52	patient, videos emailed of exercise. Follow up is now just telephone but looking to being able	
53	to meet patients face to face again	
54	No	a
55	Due to COVID for first few weeks the service was suspended. But then started via phone call.	i, k, l
56	Currently Follow up clinic is up and running virtually.	
57	Inpatient round initially paused, restarted a few months ago. Follow up clinics now virtual, either	i, k, l
58	via video or telephone. Timescale to follow up potentially longer due to back log.	
59	Telephone follow up. Email	k

Current loss of outpatient service and exercise programme. Unable to allow patients to visit critical care post-discharge. Using teleconference for ICU Steps meetings. Using more telephone consultations.	i, l
Separate fully funded MDT follow up clinic for Covid including those through ICU. Continue with inpatient ward round reviews, now also supported by a Physio. Clinic review now in virtual format, phone or attend anywhere	b, l
The staff load was much higher, so the Rehabilitation After Critical Illness pathway was sometimes not followed up. We had to move to phone calls only review.	i, k
Rehabilitation After Critical Illness consultant and Coordinator had meeting with Mental Health consultant but decided to continue link already established as numbers very small	a
No follow-up clinics	a
Business case approved so now working on developing service for the Trust	b
No new services	a
Covid have stopped all our services, but i have restarted ward based follow up visits	i
We are running the same service but at the moment the follow up clinic is being run via video link	l
Support group currently suspended - telephone calls made ad hoc to patients needing support. Priority given to acute patients on outreach service - however post discharge to ward patients still reviewed <sup>#</sup>	d, i
Outpatient clinic cancelled for three months - now via telephone, video Increased managerial interest in post covid problems	i, k, l
This has made the management think this may be important. This has led to some management cooperation with setting up a future service and a post covid service now. However we have to fund from within our dept. This may change. Clinical director now working with the ICU medical director to develop local covid rehab. It is still being shaped as a service by people with no expertise in the topic. A box will be ticked but it won't be great.	b
None so far	a
Service under development anyway. Has highlighted need for service to senior management	b
Some consultant and nursing staff went to local acute trust to help out for 3 months	i
Plan on having virtual clinics Aim to see bereaved relatives who did not get the chance to visit	i, l
Will be referred to pulmonary rehab service. Increase in staff in that service. Will not be COVID specific	i
No more resources or funding but many more patients and relatives	i
Virtual follow-up clinic now running Increased frequency to weekly rather than bi-weekly (for 3 month period) to meet patient demand Virtual or telephone physiotherapy rehabilitation Developing electronic notes for all MDT <sup>#</sup>	h, j, m
As staff were redeployed then an 2-3x weekly inpatient review was provided on the wards for all ICU survivors, but physio, physio assistant (and ICU nurse at one site). A post-COVID rehabilitation group has been set up at (second site) for ICU Survivors once home, with aim to roll out across the trust imminently, Increased clinic capacity provided for time limited period to be able to offer ICU Follow Up clinic to all ICU COVID Survivors <sup>#</sup>	g, h, j, m
Adapted to remote delivery - now weekly 1 hour group - 30 mins physio + Q+A + 'guest speakers' + mindfulness <sup>#</sup>	l
Dedicated therapy team to ICU during pandemic with a view to make this permanent. Combined COVID clinics with respiratory team/consultant. Further highlighting need for OT. Respiratory consultant has attended Group support meetings are now via zoom	b, f, h, o
Trialing of telephone follow up - very time consuming; unable to follow through patients with current staffing levels <sup>#</sup>	i, k
Reduced in hospital follow up due to staffing pressures.	i
All services paused during the peak of the pandemic. Since then the service has doubled each month to see the increased number of discharges that require rehab follow up	h, j
We have secured funding for a post Covid 19 follow up clinic. This resource can only deliver services to a small number of patients. Patients initially receive a phone-call screening. If required they can be seen in a follow up clinic (either remotely or face-to-face). This clinic is run by Medics, Nursing, Physio, OT and Psychology (one of each).	b, e, f

1	Trialling a clinic model for covid patients	b, h
2	Virtual pathway set up on discharge - 12/52 pulmonary rehab pathway run by gym techs	f, g, h
3	No face to face reviews difficulty progressing with launch of rehab service instead of existing follow up clinic	b, h
4	Have developed a follow-up service specifically for COVID patients	e
5	We delayed the follow up clinic during the pandemic period and we are not having to reinstate it. - ITU consultants are also seeing all the covid patients as we expect to see a lot of PTSD.	i
6	Difficult question to answer as our hospital was shut due to COVID outbreak. All admissions were diverted to surrounding hospitals. At time of writing we are only just starting to reopen	A
7	Fewer available healthcare professionals due to sickness or shielding	i
8	Now telephone clinic	k
9	Limited peer support	i
10	All assessments and follow up appointments have been done via either telephone or video call. No face to face appointments within the physio clinic as yet. Consultant follow up at 3/12 is now face to face as an option. Rehab group not currently running with lots of barriers to work round before it can run again. Patients are sent home exercise programme to complete with support and guidance remotely. Hoping to try a virtual class if ongoing delay to physical class being restarted. A positive has been greater joint working with Dieticians and due to the increased numbers, as the Physio now undertake the initial nutrition screen if they aren't routinely following up. will then refer to them if needed. Definitely greater MDT working with them.	g, k, l
11	We had MDT staff all working together	h
12	Sadly follow up was temporary halted due to clinical need, now back up and running. Sudden interest in COVID patients and their rehab needs but it is all ICU patients that need it.	i
13	Video and teleconferencing to patients	f
14	2 weeks post-discharge telephone follow up in addition to the usual 2-3 months post discharge follow up clinic, virtual clinics (so far telephone only)	d, j
15	Improved follow-up from ICU Therapists from ICU to ward. Improved connections with specialist rehab services. Unable to offer gym 1:1 follow-up rehab.	b, h
16	Face to face clinics now on a virtual platform; peer support meeting to go on Zoom virtual platform. Forced reduction of follow up service for non-covid patients. In-patient rehab support and information for covid patients but now discontinued due to staff returning to clinical areas. Support from the Rehabilitation clinical team for non-ventilated ICU covid patients i.e. had NIV only	i, l
17	Not critical care linked but follow up outpatient appointments for COVID patients within the respiratory department, linked with a clinical psychologist. Cards sent to critical care patients post COVID offering them to get in touch/ meet with members of staff to discuss their ICU stay	e, n, o
18	Daily physio input to covid patients as part of outreach team as 6 week pilot. Referral pathway to clinical psychologist via outreach Letter to patient's home explaining ICU journey Extended outreach on the ward including family support Telephone screening of problems prior to follow up clinic Transition from face-to-face to telephone clinic <sup>#</sup>	d, h, k
19	Our service has been put on hold temporarily due to staffing constraints	i
20	Critical care rehab team changed referral criteria to pick up all patients from ICU with Covid-19. Covid-19 rehab guide produced for inpatient and to continue once discharged. Covid-19 MDT in community is being developed. Follow Up clinic has stopped due to lockdown and acute caseload. Not yet restarted but patients highlighted are being called by Intensivist.	i, k
21	Increased number of clinics and expansion of personnel	h, j
22	MDT approach and referrals pathway	h
23	Increased ITU beds, Increased number of clinics More professionals involved. Video consultation intensive care follow up clinics <sup>#</sup>	h, j, l
24	A new Covid19 follow up clinic has been set up combined with respiratory team.	b, e, o
25	Psychology support for patients and relatives	b, h
26	Routine video clinic for most patients (with option of face-to-face review if required). Sooner first review (4 weeks rather than 8-12 weeks)	l, m
27	Initially clinic paused therefore generated waiting list. Criteria remains > 3 days on critical care. Have introduced telephoning screening system, inclusive of locally designed symptom screening questions, PHQ2, GAD2, and trauma screening questionnaire to identify patients who need MDT	i, k, l

review in follow-up clinic. If patients score > 3 on screen, > 3 on PHQ2 or GAD2, or >6 on TSQ they are invited to clinic. This screening is completed by a nurse, occupational therapist or physiotherapist. Patients who have ongoing symptoms are invited to clinic, they can attend via teleconference, face-to-face or virtually via attend anywhere. Our clinic team now includes an occupational therapist, based on temporarily agreed funding.	
Remote clinic	l
Expansion by 46 beds Recruitment of 15 consultants, 30 trainees, and ~200 nurses <sup>#</sup>	a
COVID follow up. Video conferencing clinic appointments, patients can no longer be taken back to the ITU - setting up virtual reality tours. No diaries kept during COVID - looking into virtual diaries. More interest in MDT follow up.	h, l
Considering doing outpatient follow up clinic virtually - allocated team reaching into ICU and following patients up on ward -physio led virtual clinics for all critical care patients - all post covid patients discharged from hospital, will be seen in a virtual physio led clinic	b, f
Additional clinics and more physiotherapy services	h, j
Review of services - COVID evidence/guidance as instigated review of critical care unit follow up services	b
There are plans for a follow up service	b
Increased from x2/month to x2/week. Face to face to video/telephone consultation with Respiratory physicians doing face to face clinic with investigations of heart and lungs in hospital. We focused on holistic, cognitive and psychosocial aspects. Funded via Covid block payment <sup>#</sup>	h, j, l, o
All initial assessments done over telephone, but greater input earlier in discharge process. MDT input from respiratory team	j, k, o
Increased use of phone and video call follow up	k, l
Follow up service currently on hold, although many patients have been written to and sent an ICU Steps booklet. These patients will be followed up virtually In due course. New build planned with expanded number of beds, and then re-purposing of existing beds for respiratory beds and level 1.5 beds	i, l
Nil	a
Delayed as still significant covid demand. All clinics have been cancelled & telephone clinics have been set up but hindered by lack of resources & information	j, k
Face to face clinics suspended. Support groups suspended. Home visits carried out as per government guidelines maintaining social distance at all times	i
Not aware	a
The patient support group has not been running due to social distancing and members of the public not being able to attend the hospital. The Critical care Outreach team implementation has been delayed. (it is a new service)	b, i
We have had funding for 2 rehab techs to follow pts from ITU to the ward and then home to give physical support. This funding was secured prior to Covid but has the staff have started this month so in line with Covid.	b, e
We have seen our COVID patients at 2-3 weeks post discharge instead of 2-3 months and have instigated a rehab course for them in conjunction with pulmonary rehab team <sup>#</sup>	j, l, m, o
We started the first follow up clinic last week virtually. We plan on continuing with the virtual clinics <sup>#</sup>	l
We have gone to virtual clinics. The numbers are high. It pushed the follow up agenda. During the COVID-19 response the unit now has 2 clinics that it contributes to, developed from a need to provide critical care input alongside respiratory for follow-up of all ventilated COVID-19 patients as part of the British Thoracic Society's follow-up recommendations. One clinic is led by one consultant (dual Intensive Care Medicine/Respiratory) that follows up all patients at 12 weeks (or thereabouts) in terms of physical/cognitive/psychological symptoms, and co-ordinating any on-going need for investigation/management. This clinic runs on one or two afternoons a week dependent on clinical availability of that consultant, and only started in July. It is a face to face clinic, and several screening questionnaires are used as part of the appointment. The other clinic that has been created out of the COVID-19 response is a virtual multi-disciplinary clinic (hosted on Attend Anywhere) involving consultant intensivist, psychologist and physiotherapist. They each have a half hour slot with the patient for their assessment. It runs once a week, and three consultants contribute to it. It includes all health	a, b, e, f, h, l, o

board patients that have been ventilated on the unit for 72 hours or longer. It was initially established in July as well, as a way of attempting to deliver the 6 week virtual COVID follow-up as per the BTS recommendations, but also follows up non-COVID patients <sup>#</sup>	
Psychology now directly involved (previously ICU consultant would screen and refer as needed which incurred some delay) and attend each clinic visit along with the ICU consultant Clinics suspended for 3 months due to Covid activity and escalated rotas. Unable/unwise to bring patients to hospital during lockdown so virtual clinic format set up. Due to service reconfiguration, the area formerly used for ICU clinic is unavailable, so virtual clinic will continue for the foreseeable future. Virtual format works reasonably well but it limits our ability to bring patients into the physical space of the ICU environment which many patients found very useful. We have replaced this with sharing pictures and videos over Zoom which is good but not ideal. We have found in the virtual format we have less contact with family members. In a face-to-face clinic a family member would usually attend with them and we were able to give them some support and debrief too. Patients seem less likely to involve family members on video call for some reason	b, i, l, n
New pilot service established for COVID patients - combination of virtual and face to face. Intensivist/physio/psychology team and hope to get an exercise program delivered virtually <sup>#</sup>	b, e, f, g
n/a	a
Face to face abandoned during Covid surge. Now reinstated but backlog of cases so some telephone triage occurring. Patients currently attending later after discharge than previously	i, k
We will need to do virtual clinics and lose the peer support but we will aim to bring back face to face clinics asap	i, l
Along with another hospital in the health board, we have applied for funding for a post covid follow up clinic	b
n/a	a
Nil	a
Timing, use of virtual clinic, videoconferencing. Work starting for respiratory follow up for all COVID patients admitted to level 2 or level 3 May have a one stop clinic involving many specialties specifically for COVID patients which is (organisation) wide. Still all in pipeline. Otherwise clinics will be virtual rather than meeting with limited peer support	b, l, o
No changes at present	a
Unable to offer class format so at planning level re moving forward. Phone call check-ins are commencing. Virtual appointments have been discussed but concerns re; funding and staff availability. Time consuming processes so trying to factor that in.	i, k
Cancellation of face to face reviews/ exercise classes. Move to telephone assessments in first phase. Then videoconferencing if deemed useful. Likely to result in significant reduction in what can be offered.	i, k
Testing delivery virtually via telephone and Near Me	k, l
Programme now virtual/online	l
Formal follow-up not been continued- currently on hold. Support given to bereaved families with psychology support. Letters/phone call follow up	i
No new staffing but more formalised ICU follow-up service and screening being planned with relevance to what we already do and what we could do more in a joined up fashion. All covid positive pneumonia patients have been triages and follow-up as deemed necessary within existing pulmonary rehab services.	b, h, o
During COVID the Critical Care Outreach Team were redeployed to other posts and the service was disbanded temporarily.	i
New Post ICU follow up service now partially funded	b, e, f
We have just received funding to set service up	b
1. New bi-weekly MDT initially for COVID patients but thus far has extended, at least for now, to include non-COVID patients. 2. "Tailored Talks" as discussed earlier. Novel personalised information provision support service. 3. Chest, Heart and Stroke nursing support through telephone follow up post hospital discharge, as previously mentioned	d, h, j, o
Nil	a

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Unable to deliver current group model. We have started to try and deliver a virtual programme to individuals using near me consultations and assessments. We are also considering delivering presentations remotely via videoconferencing links.	i, l
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	Massive impact on ability to deliver ward based follow up. Patients no longer attending hospital for follow up clinic. Now exploring the use of technology for virtual follow up clinic. Using a lot more telephone consultations. However, this has given us an opportunity to rethink how we do things and as a consequence we are developing a more joined up service using the MDT.	b, k, l
	There has been no changes to our service. In fact this service was cut for the first 4 weeks of the pandemic to allow staff to be pulled to deliver direct patient care.	i
	We had disruption of our service due to Covid	i
	Hospital wide Post-COVID discharge follow up service. We are also developing a post Critical Care follow up service for post-COVID patients.	b, h

\*Responses reported verbatim with the exception of edits made to ensure no identifiable detail. #Indicates a response that applied to more than one individual hospital within an overarching healthcare organisation.

Abbreviations: MDT = multidisciplinary team; ICU/ITU = intensive care/therapy unit; OT = occupational therapy; SLT = speech and language therapy.

## References

{ ADDIN EN.REFLIST }



**CHERRIES Checklist****Enhanced provision of critical illness recovery and follow-up services: a national survey and progress report**

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Item category	Checklist item	Page number	
Design	Describe survey design	7	
IRB (Institutional Review Board) approval and informed consent process	IRB approval	8	
	Informed consent	9	
	Data protection	9	
Development and pre-testing	Development and testing	7	
Recruitment process and description of the sample having access to the questionnaire	Open survey versus closed survey	8	
	Contact mode	8	
	Advertising the survey	8	
	Survey administration	Web/E-mail	8
	Context	N/A	
	Mandatory/voluntary	N/A	
	Incentives	N/A	
	Time/Date	8	
	Randomisation of items of questionnaires	7	
	Adaptive questioning	7	
	Number of items	Online Supplement	
	Number of screens (pages)	Online Supplement	
	Completeness check	8	
	Review step	Online Supplement	
Response rates	Unique site visitor	N/A	

	View rate (Ratio of unique survey visitors/unique site visitors)	N/A
	Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	9
	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	9
Preventing multiple entries from the same individual	Cookies used	N/A
	IP check	N/A
	Log file analysis	N/A
	Registration	7
Analysis	Handling of incomplete questionnaires	8-9
	Questionnaires submitted with an atypical timestamp	N/A
	Statistical correction	8-9



# BMJ Open

## Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national cross-sectional survey and progress report

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Keywords:	Adult intensive & critical care < ANAESTHETICS, Adult intensive & critical care < INTENSIVE & CRITICAL CARE, REHABILITATION MEDICINE

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3 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
4 **cross-sectional survey and progress report**  
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9 **Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams<sup>5</sup>, Ceri Battle<sup>6</sup>, Joanne McPeake<sup>7, 8, 9</sup>, Tara**  
10 **Quasim<sup>7, 8</sup>, Jon Silversides<sup>10</sup>, Andrew Slack<sup>11</sup>, Carl Waldmann<sup>12</sup>, Elizabeth Wilson<sup>13</sup>, Joel Meyer<sup>11</sup> on**  
11 **behalf of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
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**Online Data Supplement**

This article has an online data supplement.

## ABSTRACT

### Objective

To comprehensively update and survey the current provision of recovery, rehabilitation, and follow-up services for adult critical care patients across the UK.

### Design

Cross-sectional, self-administered, predominantly closed-question, electronic, online survey.

### Setting

Institutions providing adult critical care services identified from national databases.

### Participants

Multi-professional critical care clinicians delivering services at each site.

### Results

Responses from 176 UK hospital sites were included (/242, 72.7%). Inpatient recovery and follow-up services were present at 127 (/176, 72.2%) sites, adopting multiple formats of delivery and primarily delivered by nurses (n=115/127, 90.6%). Outpatient services ran at 130 sites (73.9%), predominantly as outpatient clinics. Most services (n=108/130, 83.1%) were co-delivered by 2 or more healthcare professionals, typically nurse/ICU physician (n=29/130, 22.3%) or nurse/ICU physician/physiotherapist (n=19/130, 14.6%) teams. Clinical psychology was most frequently lacking from inpatient or outpatient services. Lack of funding was consistently the primary barrier to service provision, with other barriers including logistical and service prioritisation factors indicating that infrastructure and profile for services remains inadequate. Post hospital discharge physical rehabilitation programmes were relatively few (n=31/176, 17.6%), but peer support services were available in nearly half of responding institutions (n=85/176, 48.3%). The effects of the COVID-19 pandemic resulted in either increasing, decreasing, or reformatting service provision. Future plans for long-term service transformation focus on expansion of current, and establishment of new, outpatient services.

### Conclusion

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3 Overall, these data demonstrate a proliferation of recovery, follow-up, and rehabilitation services for  
4 critically ill adults in the past decade across the UK, albeit service gaps remain suggesting further work  
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6 is required for guideline implementation. Findings can be used to enhance survivorship for critically  
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8 ill adults, inform policymakers and commissioners, and provide comparative data and experiential  
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10 insights for clinicians designing models of care in international healthcare jurisdictions.  
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**Word Count**

292

**Keywords**

Critical illness; recovery; follow-up; services; rehabilitation; survey, peer support

## ARTICLE SUMMARY

### STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the largest and most comprehensive survey of post critical illness recovery, rehabilitation, and follow-up services available across the UK
- This survey builds on previous work by examining additional stages of the survivorship continuum, as well as a greater range of services
- Our response rate achieved a representative sample of target sites, which were identified from established national registries, and with multi-professional clinicians providing data
- Limited data on non-responders precludes comparison with responders to detect response bias
- Acquiring one survey response per site, regardless of number, size, or specialty of ICUs at that site may have limited detection of bespoke differences in local service delivery

## INTRODUCTION

Survivorship following critical illness is characterised by varied, long-term impairments and disability that influence the quality and quantity of an individual patient's recovery. Follow-up of survivors, and other services such as multi-professional rehabilitation, may shape recovery experiences by promoting restoration of health through identifying and appropriately managing unmet health needs associated with post intensive care syndrome<sup>1 2</sup>. International reports indicate increasing development of follow-up services of varying structure, format, and content<sup>3-9</sup>; however prevalence data demonstrate their scarcity of <sup>10 11</sup>, with no consistent, standardised model of service delivery<sup>2</sup>.

In the United Kingdom (UK), provision of follow-up and recovery services following critical illness is embedded in national rehabilitation guidelines published in 2009 that advocate a continuum of multi-professional input spanning the recovery pathway from ICU admission to community stages<sup>12 13</sup>. Considered the 'gold standard' for patient management, a face-to-face review of patients is specifically recommended at 2-3 months after critical care discharge, including a functional reassessment and onwards referral to appropriate rehabilitation or other specialist services<sup>12</sup>. However, a nationwide survey in 2013 reviewing implementation of these guidelines found that only 27% of UK intensive care units (ICU) adhered to this recommendation and only 12 (/176) organisations offered post hospital discharge rehabilitation programmes<sup>10</sup>. Lack of funding was both the most frequent, and highest ranking, barrier to providing services, alongside insufficient prioritisation and insufficient personnel and other resources<sup>10</sup>. The intervening years have witnessed increasing attention on recovery services for critically ill patients<sup>14-16</sup>, including the role of peer support<sup>17</sup>. Therefore, the aim of the current study was to comprehensively re-survey the current provision of recovery and follow-up services for adult critically ill patients across the UK to identify unmet areas of unmet need, inform service innovation, and benchmark against clinical standards.



## METHODS

### Service identification

The sample frame was all adult NHS ICUs across the UK (England, Scotland, Wales and Northern Ireland) identified using two central registries; the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme (available at <https://www.icnarc.org/Our-Audit/Audits/Cmp/About/Participation>) and the Scottish Intensive Care Society Audit Group (SICSAG, <https://www.sicsag.scot.nhs.uk/index.html>). A total of 242 individual hospitals were identified from the ICUs listed in these registries.

### Survey development

A cross-sectional, predominantly closed-question, online open-survey was designed by the investigators (see Supplementary File 1). Survey content was generated from collective clinical experience and expertise of the investigators using the previous survey as a foundation<sup>10</sup>. Survey questions were sequentially ordered, iteratively refined, with single or multiple response options created for each question, and inclusion of free-text options for further relevant detail. Pilot testing was by three independent, and one internal, critical care practitioners with specialist subject interest and experience. This process ensured content, construct, and face validity, and sensibility, to ensure i) comprehension and interpretation of questions, ii), flow, salience, acceptability, and ease of completion, iii) missing items or response options, and iv) time required to complete<sup>18</sup>. Survey content was also reviewed by members of the Faculty of Intensive Care Medicine Life After Critical Illness Working Group. After refinement and optimisation, the final version was approved by the investigators.

Survey domains were: i) demographics of critical care services; ii) services delivered on inpatient wards after ending critical care, including the transfer process from ICU; iii) outpatient services delivered following hospital discharge; iv) service relationships with other local healthcare infrastructure; v)

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3 peer support programmes; and vi) physical rehabilitation programmes. Respondents were requested  
4 to report their *pre-COVID-19 pandemic* service provision. The final survey question requested  
5 respondents to report any changes to existing, or development of new, services due to the pandemic.  
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### 10 11 12 **Survey distribution**

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14 An invitation email containing the link to the online survey (hosted via Survey Monkey,  
15 <https://www.surveymonkey.com/>) and a Participant Information Sheet, was circulated via i) Faculty  
16 of Intensive Care Medicine membership, ii) national critical care networks across each of the four UK  
17 nations, iii) the National Institute for Health Research Critical Care National Specialty Group, iv) the  
18 ICNARC Case Mix Programme membership, v) professional contacts of the authors, and vi) related  
19 social media, that facilitated a snowballing approach to dissemination. Instructions for survey  
20 completion highlighted the need for a designated lead respondent to coordinate an accurate multi-  
21 professional response from each site. The survey was open for completion for a period of 8 weeks  
22 (June – August 2020), and repeated circulation of the survey, including targeted approaches to non-  
23 responders where possible, was undertaken during this period. A further 4 weeks was allowed for  
24 follow-up with sites on data queries.  
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### 41 **Patient and public involvement**

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43 Patients were not involved in the design, conduct, or reporting of this research as it was focused on  
44 surveying current clinical services. However, findings from this survey will inform white papers to be  
45 developed and reported by the Faculty of Intensive Care Medicine Life After Critical Illness Working  
46 Group which includes patient and family representation.  
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### 52 **Ethical approval, data management, and data analysis**

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55 The study was approved by King's College London Research Ethics Committee (MRA-19/20-17855),  
56 and is reported in keeping with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES)  
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3 19. Survey completion was considered indicative of informed consent for participation. Data were  
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5 downloaded from the survey platform into Microsoft Excel (Microsoft Corp, Washington, US), and  
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7 stored in password-protected files and devices. Multiple responses for any individual hospital site  
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9 were de-duplicated and amalgamated into one single response set. Respondents were contacted for  
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11 missing or erroneous data, or the most complete and/or first-received response set was used as the  
12  
13 final response option. Descriptive statistics were used to analyse quantitative responses including  
14  
15 normality testing, means and standard deviations (SD), medians and interquartile ranges (IQR),  
16  
17 frequencies, proportions, and 95% confidence intervals (CI) where appropriate. Summative content  
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19 analysis was used for free text comments <sup>20</sup>. A response rate of more than 70% was considered *a*  
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21 *priori* to indicate a representative sample <sup>18 21</sup>. Analyses were performed in Microsoft Excel and  
22  
23 GraphPad Prism (v9.0, GraphPad Software, San Diego, US).  
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## 32 RESULTS

### 33 Responding institutions

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35 In total 186 (/242, 76.9%,) individual hospitals registered a survey response. Ten blank responses were  
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37 discounted leaving 176 hospitals included in analysis (/242, 72.7%,); across the 4 UK nations, this  
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39 comprised Scotland (n=23/23, 100.0%), Wales (n=12/15, 80.0%), Northern Ireland (n=7/9, 77.8%),  
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41 England (144/195, 73.8%). Demographic data for respondent hospitals are reported in Table 1.  
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### 48 Inpatient critical illness recovery and follow-up services

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50 All respondents reported processes for managing discharge handovers for patients transitioning from  
51  
52 critical care to the ward. Data describing these handover processes are reported in Supplemental File  
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54 2, Section E1. Following ICU step down, 127 (/176, 72.2%) operated a targeted inpatient  
55  
56 recovery/follow-up service, established for a median (IQR) of 10.0 (5.0-16.0) years. Twenty sites (/176,  
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58 11.4%) focused solely on outreach readmission prevention. Key features of services are summarised  
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3 in Table 2 and Supplemental File 2, Section E2. Diverse service models included bedside consultation,  
4 education of ward staff around post ICU issues, information provision to patients and families, and  
5 multi-professional ward rounds. Where services were available, they were primarily delivered by  
6 nurses (n=115/127, 90.6%), physiotherapists (n=70/127, 55.1%), or ICU physicians (n=47/127, 37.0%),  
7 with clinical psychology most frequently cited as lacking (n=55/127, 43.3%). Referrals were generated  
8 from manual patient-list triages (n=80/127, 63.0%), automated systems (n=23/127, 18.1%), or  
9 electronic patient records (n=20/127, 15.7%). Just over half of respondents (n=69/127, 54.3%) used  
10 a screening tool to identify post intensive care issues (e.g. anxiety and depression, post-traumatic  
11 stress disorder, physical and functional performance, delirium, or psychological status). Funding for  
12 services was primarily from internal critical care funds (n=71/127, 55.9%) and institutional health  
13 service funds (n=45/127, 30.6%) with other sources including organisational charities, grant funding,  
14 non-critical care departments, or volunteer goodwill cover (all <10%).  
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### 32 **Outpatient critical illness recovery and follow-up services**

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34 Outpatient services were reported in 130 institutions (/176, 73.9%) established for a median (IQR) of  
35 9.0 (4.0-15.0) years (Table 3, with expanded data reporting in Supplemental File 2, Section E3).  
36 Magnitude of outpatient caseload varied from an estimated 10 to 500 new patients per year, and  
37 subsequent outpatient re-evaluations ranging from an estimated 0 to 350 per year. An estimated  
38 12,000 patients receive outpatient follow-up per year (at responding institutions only, out of  
39 approximately 117,000 estimated annual ICU admissions). The predominant service model was an  
40 outpatient clinical consultation lasting 30-60 minutes and scheduled 2-3 months following hospital  
41 discharge. Patients are consulted by the multi-professional team all together (n=77/130, 59.2%) or  
42 separately one at a time (n=42/130, 32.3%) by clinician(s), primarily comprising nurse (n=121/130,  
43 93.1%), ICU physician (n=100/130, 76.9%), and physiotherapy (n=65/130, 50.0%) professions. In most  
44 services (n=108/130, 83.1%), a combination of two, three, or more, different multi-professional  
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3 clinicians ran services (Figure 1, ODS Table E1). The professional discipline most frequently cited as  
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5 lacking was clinical psychology (n=61/130, 46.9%).  
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10 Clinician, and self, referrals, were the most common routes to access services. Similar numbers of  
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12 services reported acceptance (n=50/130, 38.5%), and non-acceptance (n=48/130, 36.9%), of referrals  
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14 from outside the geographical catchment area of the primary hospital (31 respondents, /130, 23.8%,  
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16 reported this as discretionary). Over half of services (58.5%) used a screening tool for post intensive  
17  
18 care issues, with a heterogenous range of outcome measures and/or tools for assessment  
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20 (Supplemental File 2, Table E2). Aspects of recovery addressed in follow-up consultations were  
21  
22 diverse and comprehensive, reflecting both symptom presentation as well as onwards referrals to  
23  
24 specialist services (Table 3); nearly all included a review of the patient's ICU history (n=123/130,  
25  
26 94.6%), and for the majority, an opportunity to visit to the ICU where they had been admitted  
27  
28 (n=114/130, 87.7%). Funding for services was primarily sourced from internal critical care funds  
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30 (n=65/130, 50.0%) with nearly a third underpinned by national health service-funding (n=38/130,  
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32 29.2%), and a small proportion unfunded (n=19/130, 14.6%).  
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### 39 **Barriers and challenges to offering recovery and follow-up services, and links with other services**

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41 Sites without inpatient or outpatient services cited the following barriers: lack of funding (n=35/46,  
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43 76.1%), insufficient staff (n=26/46, 56.5%), lack of space/venue (n=17/46, 37.0%), lack of service  
44  
45 prioritisation by management (n=17/46, 37.0%), lack of suitably trained staff (n=12/46, 26.1%),  
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47 resources prioritised to other patient groups/clinical areas (n=13/46, 28.3%), lack of evidence to  
48  
49 suggest benefit (n=8/46, 17.4%), insufficient patient numbers to justify (n=5/46, 10.9%), and  
50  
51 uncertainty regarding content to include in a service (n=3/46, 6.5%). Many of these resonated as  
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53 challenges to service delivery and maintenance reported by those with existing services (Tables 2 and  
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55 3), in particular issues of staffing, funding, and service prioritisation.  
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3 Three-quarters of respondents (133/176, 75.6%) reported links between their own and similar  
4 services in neighbouring institutions (Supplemental File 2, Section E4); categories fell broadly into two  
5 themes reflecting informal knowledge, practice, and service reciprocity, and formal referral pathway  
6 access and coordination. Links with primary care or community interface services were less frequent  
7 (87/176, 49.4%), with examples centring on either direct referral into services, or varied forms of  
8 engagement with primary care physicians.  
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### 19 **Peer support after critical illness**

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21 Peer support services for patients and families were available in nearly half of responding institutions  
22 (n=85/176, 48.3%) (Supplemental File 2, Section E5), predominantly as community or hospital-based  
23 support group meetings (n=57/85, 67.1%). Other formats included peer support groups based within  
24 ICU follow-up clinics (n=11/85, 12.9%) or within ICU (n=5/85, 5.9%), psychologist-led outpatient  
25 groups (n=4/85, 4.7%), or affiliation with ICU charity-led support groups (n=3/85, 3.5%).  
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29 Peer support varied between informal meetings (n=35/85, 41.2%), facilitated discussion (n=20/85,  
30 23.5%), or a structured agenda of talks and presentations (n=9/85, 10.6%). Twelve respondents (/85,  
31 14.1%) reported a 'drop-in' structure, and a further 9 (/85, 10.6%) reported a mixed, flexible approach.  
32  
33 On average, sessions (of any format or structure) were held a median (IQR) of 4.5 (4.0-9.0) times per  
34 year, although absolute frequency ranged largely (minimum-maximum 1.0-52.0 per year). Participant  
35 attendance was a median (IQR) of 10.0 (6.0-15.0) former patients and 6.0 (5.0-10.0) caregivers. Staff  
36 input was multi-professional; critical care nursing staff being involved in nearly all services (n=81/85,  
37 95.3%), with ICU physician (n=40/85, 47.1%) and allied health professional (n=39/85, 45.9%) staff  
38 involved in nearly half, and psychologists in 17 (/85, 20.0%). Most services were not affiliated to any  
39 formal networks (n=49/85, 57.6%). Where affiliation was in place (n=33/85, 38.8%), this was primarily  
40 with national UK networks (ICU Steps (<https://www.icusteps.org/>), n=27 and InS:PIRE (Intensive care  
41 Syndrome: Promoting Independence and Return to Employment, [www.nhsggc.org.uk/inspire](http://www.nhsggc.org.uk/inspire)), n=2),  
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3 and the international CAIRO network (Critical and Acute Illness Recovery Organization,  
4 <https://sites.google.com/umich.edu/cairo/home>, n=4).  
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### 10 **Post hospital discharge physical rehabilitation programmes**

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12 Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31  
13 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26/31, 83.9%),  
14  
15 or in combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or  
16  
17 rehabilitation assistant (all n=1/31, 3.2%, each). One programme was led by an exercise/sports  
18  
19 therapist. Clinicians leading programmes were either ICU-specialist (n=19/31, 61.3%) or  
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21 rehabilitation-specialist (n=12/31, 38.7%). Details of the structure, format, and content of physical  
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23 rehabilitation programmes are reported in Supplemental File 2, Section E6.  
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### 30 **Future plans**

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32 Respondents' comments about future plans for their services (within 2-5 years), in terms of instigation,  
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34 development, or expansion, were themed into categories (Table 4). The main two themes centred on  
35  
36 expansion of current, and establishment of new, outpatient services.  
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### 41 **Impact of the COVID-19 pandemic**

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43 Nearly all respondents (n=162/176, 92.0%) described the impact of the COVID-19 pandemic on  
44  
45 services. Themes characterising these effects (and frequency of occurrence) were: i) existing service  
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47 capacity/activity increased or decreased (n=88/162, 54.3%), ii) existing service changed to telephone  
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49 or virtual (n=74/162, 45.7%), iii) new services implemented (phone-based, face-to-face, virtual, or  
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51 exercise) (n=57/162, 35.2%), iv) applying for funding/new service (n=44/162, 27.2%), v) existing  
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53 service increased in frequency (n=20/162, 12.3%), vi) follow-up combined with respiratory medicine  
54  
55 services (n=20/162, 12.3%), vii) no change (n=17/162, 10.5%), viii) shortened interval between review  
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57 appointments (n=11/162, 6.8%), ix) addition of psychologist to service (n=6/162, 3.7%), x) research  
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3 about follow-up initiated (n=1/162, 0.6%). Full details of respondents' narrative comments are  
4 reported in Supplemental File 2, Section E7.  
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## 11 **DISCUSSION**

12 Findings from this comprehensive national survey characterise the continuum of multi-professional  
13 recovery, follow-up, and rehabilitation services currently provided for adult critically ill patients across  
14 the UK. Ward-based follow-up is highly prevalent, and a remarkable expansion of outpatient follow-  
15 up services is evident, whilst post hospital discharge physical rehabilitation programmes remain  
16 relatively low in number. Peer support services available in nearly half of sites support its importance  
17 for contributing to survivorship. Lack of funding commonly precluded service provision, and logistical  
18 and prioritisation barriers indicate that infrastructure and profile for services remains inadequate.  
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### 32 **Interpretation of the findings**

33 More than 70% of sites provided targeted longitudinal follow-up support to patients on the wards  
34 following ICU discharge with more than half incorporating screening for post intensive care syndrome.  
35 This is in keeping with recommended practice<sup>12</sup>, and signifies a practice of early identification and  
36 management of problems as well as onwards recovery planning. Comparative data on prevalence of  
37 inpatient recovery services are limited; one smaller previous survey reported only around one-third  
38 of sites were guideline-adherent on ward-based input following critical illness<sup>22</sup>.  
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50 Increased prevalence of outpatient services at 74% of institutions, compared with 27% previously<sup>10</sup>, is  
51 striking, and vastly exceeds international counterparts<sup>11</sup>. Underlying factors behind this considerable  
52 growth are unclear, but greater appreciation of the long-term consequences of critical illness from  
53 within the clinical community could be speculated given that half of services were funded via internal  
54 critical care sources, many were delivered within existing roles without dedicated additional time, and  
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3 clinician referral to services surpassed objective criteria. Scheduling of follow-up was also adherent  
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5 with national recommendations<sup>12</sup>. However, uni-professional service delivery by nursing staff  
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7 prevailed in the outpatient context despite the empirical value of many other disciplines, and even  
8  
9 though representation from clinical psychology doubled in outpatient compared to inpatient services,  
10  
11 this was the most frequently reported missing profession from both. This emphasises both the need  
12  
13 for investment in personnel, and the urgency of addressing psychological morbidity in survivors<sup>23-25</sup>,  
14  
15 which can influence engagement with other aspects of recovery, and contribute to hospital  
16  
17 readmission<sup>26</sup>. Likewise, occupational therapy is another example of a key profession that would  
18  
19 benefit from greater prevalence within services compared to the levels seen in the current findings,  
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21 especially in the context of long-term cognitive impairment in critical illness survivors<sup>27-29</sup>, and the  
22  
23 challenges of returning to work in this patient population<sup>30-33</sup>.  
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30 Engagement with primary care reduced from inpatient to outpatient stages of management.  
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32 Partnership with primary care is key to optimising quality of critical illness recovery<sup>34</sup>; Qualitative  
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34 exploration of unplanned hospital readmission in ICU survivors highlights many contributing themes  
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36 that primary care clinicians would be ideally placed to support during recovery e.g. multimorbidity,  
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38 polypharmacy, inadequate social support, and challenges with specialist equipment<sup>26 35</sup>. Improving  
39  
40 information provision on patients' ICU admissions and their consequences could be a simple yet  
41  
42 effective and valued strategy to start<sup>36 37</sup>, especially where primary care physicians may see relatively  
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44 few post ICU patients. Utilising remote, virtual platforms may facilitate this happening in person to  
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46 complement written or electronic forms. Furthermore, advocating a routine appointment for post  
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48 intensive care patients with their primary care clinician to review status early in the community stage  
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50 of recovery; this could be held jointly with a post ICU follow-up appointment for efficient shared  
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52 clinical management and learning.  
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3 Post hospital discharge physical rehabilitation programmes also increased since last surveyed. That  
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5 this increase is much more modest (from 7% to 18%) may be multifactorial, but one possibility is the  
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7 relative 'burden' of leading the delivery of such services by only one profession, namely physiotherapy  
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9 - lack of sufficient staff features highly as a barrier in the current dataset. Broadly, the structure,  
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11 format, and content, of delivery of physical rehabilitation programmes mirrored previously reported  
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13 findings, albeit two thirds of programmes still utilised referrals to other bespoke rehabilitation  
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15 programmes e.g. pulmonary and cardiac, to manage unmet need even though these may not cater  
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17 optimally for patients following critical illness<sup>10</sup>. The limited overall availability of these rehabilitation  
18  
19 services speaks to the need to consider alternative strategies to deliver therapeutic interventions.  
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21 One option is to consider home-based services, which may be essential for those patients where  
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23 mobility limitations preclude physical attendance at other venues, as well as those in rural areas, with  
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25 social isolation, or relatively less caregiver support. The impact of the COVID-19 pandemic has seen  
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27 an exponential rise in diverse models of care with greater use of virtual platforms that could be  
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29 investigated further in the future to ensure maximum inclusivity of patients into rehabilitation  
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31 programmes.  
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39 Peer support benefits patients, relatives, and staff during survivorship<sup>15 38 39</sup>. Six models have been  
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41 described<sup>17</sup>; our data indicate a predominance of community-based peer support with no evidence  
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43 for online delivery, albeit this may have evolved in the interim due to pandemic restrictions to physical  
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45 in-person meeting. Barriers (e.g. non-attendance, access to skilled facilitators, bureaucratic  
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47 limitations) and enablers (e.g. motivated interprofessional clinicians, patient and family volunteers,  
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49 links to ICU follow-up clinics) to peer support services have been previously explored through focus  
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51 group inquiry with clinicians<sup>14 17</sup>. As peer support continues to embed within the armamentarium of  
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53 post critical illness recovery, including for patients surviving post COVID-19<sup>40</sup>, our data can be used to  
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55 support the emergence of other models of delivery within the UK setting, with reference to these  
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3 barriers and enablers to ensure individual participant preferences for mode of engagement with peer  
4 support are met.  
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10 Lack of funding most often precluded delivery of critical illness recovery and follow-up services,  
11 followed by availability of sufficient staff; these, and other findings on reported barriers, closely mirror  
12 previous data<sup>10</sup>. A key issue affecting funding and deliverability is disparity between commissioning  
13 processes, often at national and local level respectively for inpatient and outpatient critical care  
14 services, that currently do not mandate adherence to the national guidelines. This disconnect fails to  
15 reflect the continuum over which recovery occurs from ICU admission to discharge home, and the  
16 attainment of individualised goals of recovery. Reliance on bespoke local commissioning applications  
17 to source funding therefore directly affects equity of access to critical care outpatient services. Key to  
18 application success are the strength of national guidelines, quality standards, patient/caregiver value,  
19 and the observation from care quality commissioners that inpatient services are impacted positively  
20 by outpatient follow-up. However, these empirical-reported benefits are often insufficient to secure  
21 funding, as reflected in this survey, because they are frequently countered by demands for evidence  
22 to demonstrate clinical and cost effectiveness; at present neither follow-up clinics or post hospital  
23 discharge physical rehabilitation programmes are supported by meta-analysis data<sup>2 41</sup>, and there is an  
24 absence of consensus on the most appropriate metric to reflect 'success'. Evidence-gaps exist around  
25 the optimum version of either modality and the service-user voice is often missing in shaping  
26 research<sup>15</sup>. Reliance on internal funding sources to deliver services results in the disparity in workforce  
27 composition seen in our findings. In the future, standardising data collection across services may serve  
28 to build evidence around the impact on patient outcomes.  
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54 How much the COVID-19 pandemic influences the current landscape of critical illness recovery, follow-  
55 up, and rehabilitation services, in the long-term remains to be seen<sup>42 43</sup>. Our findings indicated both  
56 'positive' (e.g. service expansion, addition of professional specialties) and 'negative' (e.g. lack of  
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3 resources, loss of physical in-person contact) impacts. We also detected a signal towards service  
4 digitisation, albeit this would require careful management to prevent issues such as digital poverty  
5 and literacy from limiting access. In the UK, post-COVID-19 follow-up clinics are underpinned by large-  
6 scale national funding, and aim to address short- and long-term sequelae affecting patients <sup>44</sup>, but  
7 there are also data reporting international efforts <sup>45</sup>, as well as empirical reports of local service  
8 development. We posit that the current data, detailing existing national services at a granular level,  
9 may be informative for future commissioning and policy-makers in directing resources towards  
10 services for *all* patients recovering from critical illness, irrespective of causal illness or injury, to ensure  
11 evidence-based provision of care. A blended payment model for critical care services, incorporating  
12 an outpatient tariff within the outcome element would be transformational. This would provide  
13 financial resources for all ICUs to include post ICU discharge services (whereas existing funding is  
14 limited to the ICU period), enabling the standardisation and improvement in the equity of access of  
15 services for patients across all four nations.

### 31 32 33 34 **Critique of the method**

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36 This study benefits from a number of strengths. Sampling was through two national registries, and  
37 survey design was rigorous and comprehensive, including external pilot testing. The inclusion of *in-*  
38 hospital services increases the value of the current dataset that now provides detailed  
39 characterisation on available services across the continuum of critical illness recovery. Survey  
40 platform functionality was maximised to mitigate respondent burden or fatigue<sup>46</sup>. Survey  
41 dissemination adopted multiple methods and respondents represented a wide range of professions.  
42 This approach facilitated a high response rate exceeding our *a priori* threshold for representativeness,  
43 with minimal missing data.

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48 We encouraged a coordinated multi-professional response from each institution anticipating  
49 enhanced accuracy of data. However, any limitation in availability or cooperation of colleagues could  
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3 hypothetically have impacted the quality and reliability of responses. Furthermore, limited data on  
4 non-responders precluded comparison with responders to detect presence of any response bias<sup>21 47</sup>.  
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6 For pragmatic purposes we sought one survey response per hospital, regardless of the number, size,  
7 or specialty of ICUs at that hospital. However, some bespoke differences may exist in recovery,  
8 rehabilitation, and follow-up services according to ICU specialty that were not detectable in the  
9 current survey. Where more than one unique hospital was part of a single overarching healthcare  
10 provider, we still required an individual survey response per hospital to account for potential inter-  
11 hospital differences in services.  
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23 Our data reflect UK NHS provision (as of mid-2020), potentially impacting extrapolation of findings to  
24 other healthcare jurisdictions. UK national guidelines offer a valuable scaffold to guide patient  
25 management. However, the granular, multi-centre, national-level data clearly demonstrate a wide  
26 range of recovery and follow-up services of varying structure, format, content, staffing, and delivery,  
27 and from a diverse population of hospitals. As such, clinicians from other international healthcare  
28 settings could consider elements for potential adaptation and translation into local services. In the  
29 future, international consensus from professional organisations around the key components of post  
30 critical care services would be beneficial.  
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## 43 **CONCLUSION**

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45 This study provides a comprehensive snapshot of the UK landscape of post critical illness recovery,  
46 follow-up, and rehabilitation services, including an indication of the impact of pandemic  
47 circumstances. Service sustainability will require improved referral pathways, enhanced partnership  
48 with primary care, greater medical engagement, and adoption of national standards. These data  
49 complement national and international efforts to optimise quality of care and outcomes of survivors  
50 of critical illness.  
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### **AUTHOR CONTRIBUTIONS**

BC, AS, CW, and JM conceived and designed the study. BC drafted an initial survey version, and all authors (BC, RM-C, CA, CB, JM, TQ, JS, AS, CW, EW, JM) contributed to iteration and refinement in survey content and design. BC, CA, CB, EW, JS, CW, facilitated survey dissemination via established networks. BC was responsible for overall data acquisition via the online survey platform. BC and RMC analysed the data. BC and JM interpreted the data and agreed data reporting. BC drafted and revised manuscript versions, and all authors (BC, RM-C, CA, CB, JM, TQ, JS, AS, CW, EW, JM) agreed the final manuscript version for submission.

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## DATA SHARING STATEMENT

Data are not publicly available for confidentiality reasons, however all data are reported.

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## FIGURE LEGENDS

**Figure 1.** Composition (A) and size (B) of multi-professional teams delivering outpatient recovery and follow-up services

### *Legend*

- A. Bar graph depicts number of outpatient services with various multi-professional team combinations. Detail of each corresponding profession is summarised in the table below. Total number of services = 130. Table E1 (Online Data Supplement) provides additional data on exact frequencies of occurrence of each combination. n (%) detailed by each profession reports the frequency of involvement of each profession across all 130 outpatient services. n=14 (10.8%) of 'Other' professions involved: Citizens Advice Bureau, n=4, Volunteers, n=2, Carers Association, n=2, Cognitive Behavioural Therapy, Rehabilitation Team, Advanced Critical Care Practitioner, Patient Liaison Service, Head Injury Specialist, Health Promotion Advisor, all n=1. Generic Rehabilitation Assistants are healthcare workers (some may have healthcare qualifications, but this is not essential) who offer support to qualified clinicians with carrying out various rehabilitation activities with patients.
- B. Pie chart summarises the relative proportion of each team size (regardless of composition)

*Abbreviations:* PT = physiotherapist; OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner.

## TABLES

**Table 1.** Demographics of respondent hospitals

Characteristic	n (/176, %)
Type of hospital	
District general	99 (56.3)
University teaching	63 (35.8)
Specialist centre	11 (6.3)
Other <sup>a</sup>	3 (1.7)
Profession of survey respondent	
Medic	79 (44.9)
Nurse	42 (23.9)
Physiotherapist	21 (11.9)
Other <sup>b</sup>	34 (19.3)
Critical Care service metrics	
Total critical care beds	3979
- Total ICU capability	2382
- Total HDU capability	1597
Estimated annual ICU admissions	116944
Type of critical care unit <sup>c</sup>	
General (mixed medical and surgical)	167 (94.9)
Trauma	52 (29.5)
Cardiothoracic	35 (19.9)
Neurological/Neurosurgery	34 (19.3)
Spinal	28 (15.9)

Liver	26 (14.8)
Burns	19 (10.8)
ECMO	9 (5.1)
Other <sup>d</sup>	37 (21.0)

*Abbreviations:* UK = United Kingdom; ICU = intensive care unit; HDU = high dependency unit; ECMO = extracorporeal membrane oxygenation

*Legend:* <sup>a</sup>Other includes: University-affiliated and Specialist combined, n=3. <sup>b</sup>Other includes: i) Profession not specified/reported, n=26 (e.g. Team Lead, Clinical Director, Ward Manager), ii) Various, n=5 (e.g. Clinical Educator, Audit lead), iii) Psychologist, n=2, iv) Dietitian, n=1. <sup>c</sup> Respondents could select more than one response therefore % exceeds 100%.

<sup>d</sup>Other denotes various specialties e.g. oncology, maxilla-facial, obstetrics, renal.

**Table 2.** Features of targeted inpatient recovery and follow-up services following critical illness

Feature	Options	n/127 (%)
Type of service provision <sup>a</sup>	Outreach/rapid response (patient outcomes) Engagement/education of ward staff re: post ICU issues Information provision ICU physician /AHP/nurse ward round Family support Psychological intervention Generic rehabilitation assistant/care coordinator Peer support Formal MDT meeting Research/academic contact Other <sup>b</sup>	71 (55.9) 65 (51.2) 62 (48.8) 47 (37.0) 36 (28.3) 36 (28.3) 25 (19.7) 23 (18.1) 17 (13.4) 8 (6.35.4) 15 (11.8)
Eligibility criteria	All patients Length of stay in critical care <sup>c</sup> Clinician/ward referral Days of mechanical ventilation <sup>d</sup> Type of therapies received during critical care admission Self-referral Diagnosis at critical care admission Other <sup>e, f</sup>	72 (56.7) 54 (42.5) 37 (29.1) 31 (24.4) 21 (16.5) 14 (11.0) 11 (8.7) 28 (19.0)
Professions involved in service delivery	Nurse Physiotherapist ICU physician Speech and Language Therapist	115 (90.6) 70 (55.1) 47 (37.0) 41 (32.3)

	Dietitian	39 (30.7)
	Occupational Therapist	27 (21.3)
	Pharmacist	27 (21.3)
	Generic rehabilitation assistant	19 (15.0)
	Psychologist	17 (13.4)
	Administrative support	13 (10.2)
	Social Worker	8 (6.3)
	Psychiatrist	5 (3.9)
	Other <sup>g</sup>	19 (15.0)
Key challenges to delivering and sustaining services	Staffing number	104 (81.9)
	Time	90 (70.9)
	Staffing profile	43 (33.9)
	Patient location	25 (19.7)
	Environment	21 (16.5)
	Funding	12 (9.4)
	Other <sup>h</sup>	14 (11.0)

Abbreviations: ICU = intensive care unit. MDT = multidisciplinary team. NHS = National Health Service

Legend: <sup>a</sup>99 sites reported outreach services for readmission prevention in addition to targeted recovery and follow-up services. <sup>b</sup>Other includes: Nurse review, n=6, Multiprofessional input, n=6, Patient support, n=2, Physiotherapy input, n=1. <sup>c</sup>>2 days, n=1, 3 days, n=6, >3 days, n=8, 4 days, n=1, >4 days, n=5, >7 days, n=3. <sup>d</sup>Any, n=1, 2 days, n=1, 3 days, n=2, >3 days, n=4, >4 days, n=5. <sup>e</sup>Other includes: Patient pathway, n=7, Delirium, n=7, Rehabilitation needs, n=5, Psychological status, n=3, Physical status, n=3, Age, n=2, Illness acuity level, n=1. <sup>f</sup>Patients receiving palliative care, or other specialist care/diagnosis-related pathways, and routine post-operative patients were generally not included in services. <sup>g</sup>Other includes: Outreach Team, n=14, Other rehabilitation/medical healthcare professionals, n=3, Advanced Critical Care Practitioner and Counsellor, both n=1. <sup>h</sup>Other includes: Staffing capacity, n=5, Lack of service prioritisation by management, n=3, Staff engagement with service, n=3, Staff recruitment, n=2, Links with primary care, Resources, and Appropriate service focus, all n=1.



**Table 3.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (/130, n, %)
Eligibility criteria	Clinician referral Self-referral Diagnosis Length of stay critical care <sup>a</sup> Days of mechanical ventilation <sup>b</sup> Therapies received All patients Other <sup>c</sup>	60 (46.2) 49 (37.7) 22 (16.9) 18 (13.8) 17 (13.1) 11 (8.5) 8 (6.2) 18 (13.8)
Process for identifying eligible patients	Triage of all critical care discharges Review of care records Local database Verbal clinician referral Automated IT process EPR request for clinic appointment Blanket invitation to all patients (no triage) Other <sup>d</sup>	79 (60.8) 52 (40.0) 45 (34.6) 37 (28.5) 19 (14.6) 10 (7.7) 9 (6.9) 2 (1.5)
Process of monitoring patients	Ad hoc patient list/spreadsheet Automated process Electronic patient record-generated list Other database	94 (72.3) 15 (11.5) 13 (10.0) 3 (2.3)

Method of patient contact regarding appointment	Postal letter	124 (95.4)
	Telephone call	88 (67.7)
	Text reminder	20 (15.4)
	Other <sup>e</sup>	10 (7.7)
Funding sources for outpatient services <sup>f</sup>	Funded internally from critical care funds	65 (50.0)
	National health service funding	38 (29.2)
	Volunteer/goodwill only	19 (14.6)
	Other internal institutional funding	7 (5.4)
Aspects of consultation	Review of ICU history and ICU events	123 (94.6)
	Patient visit to ICU	114 (87.7)
	Assessment of sleep	99 (76.2)
	Physical function assessment	96 (73.8)
	Return/review of ICU diary	94 (72.3)
	Physiotherapy referral	91 (70.0)
	Psychological assessment	86 (66.2)
	Clinical psychology referral	70 (53.8)
	Lifestyle/risk factor review	69 (53.1)
	Dietitian referral	67 (51.5)
	Speech and Language Therapy referral	60 (46.2)
	Family/caregiver needs assessment	54 (41.5)
	Review of goals and preferences of care	53 (40.8)
	Employment/occupation review	50 (38.5)
	Assessment of sexual function	49 (37.7)
	Occupational Therapy referral	47 (36.2)
	Nutritional assessment	47 (36.2)

	Pharmacy review/medicines reconciliation	46 (35.4)	
	Cognitive assessment	38 (29.2)	
	Vital signs/observations	33 (25.4)	
	Physical examination	33 (25.4)	
	Social needs assessment	33 (25.4)	
	Travel assessment (e.g. driving, flying)	31 (23.8)	
	Assessment of financial status	19 (14.6)	
	Occupational function assessment	13 (10.0)	
	Speech and language assessment	12 (9.2)	
	Psychiatric assessment	11 (8.5)	
	Immunisation review	10 (7.7)	
	GP referral/information	8 (6.2)	
	Other <sup>g</sup>	7 (5.4)	
Duration of appointment		New <sup>h</sup>	Follow-Up <sup>i</sup>
	<30 minutes	3 (2.3)	24 (18.5)
	30 minutes – 1 hour	67 (51.5)	61(46.9)
	1.0-1.5 hours	46 (35.4)	15 (11.5)
	1.5-2 hours	7 (5.4)	2 (1.5)
	2-2.5 hours	2 (1.5)	3 (2.3)
	2.5-3.0 hours	2 (1.5)	0
	>3 hours	2 (1.5)	0
	Other	0	13 (10.0)

Key challenges to delivering and sustaining services	Time	107 (82.3)
	Funding	95 (73.1)
	Personnel	71 (54.6)
	Space	67 (51.5)
	Perceived value or priority	52 (40.0)
	Managerial engagement	37 (28.5)
	Pressure from other services	27 (20.8)
	Staff engagement	15 (11.5)
	Other <sup>i</sup>	10 (7.7)

*Abbreviations:*

*Legend:* <sup>a</sup>≥2 days, n=6, ≥3 days, n=15, ≥4 days, n=6, ≥5 days, n=6, ≥7 days, n=4, >14 days, n=1. <sup>b</sup>>24 hours, n=1, ≥2 days, n=5, ≥3 days, n=12, ≥4 days, n=6, ≥5 days, n=7. <sup>c</sup>Other includes: Illness acuity, n=6, post intensive care syndrome, n=5, delirium, n=5, psychological problems, n=3, age, n=2, neurological impairment and locality, both n=1. Short length of stay (< 48 hours) and/or non-ventilated patients generally not deemed eligible for follow-up. <sup>d</sup>Other includes: Self-referral, n=1, via support group, n=1. <sup>e</sup>Other includes: Given appointment prior to hospital discharge, n=5, Email, n=4, Information leaflet, n=1. <sup>f</sup>n=1 missing response. Respondents (n=7) also commented that commissioned services for some patients e.g. trauma were available, that Outreach services and Charity support contributed some funding, and that some elements of some services were unfunded. <sup>g</sup>Other includes: General review, n=3, Signposting to local services, Referral to other specialties, Patient/relative feedback on service, Cardiac/respiratory/exercise referral, all n=1. <sup>h</sup>n=1 missing response. <sup>i</sup>Other includes: No subsequent follow-up appointment, n=10, No consistent follow-up appointment, n=2, Variable duration, n=1. <sup>j</sup>Other includes: None, n=2, Lack of administrative support and lack of referral pathways, n=2, Lack of community services, patient engagement, insufficient patient need, and current pandemic, all n=1.

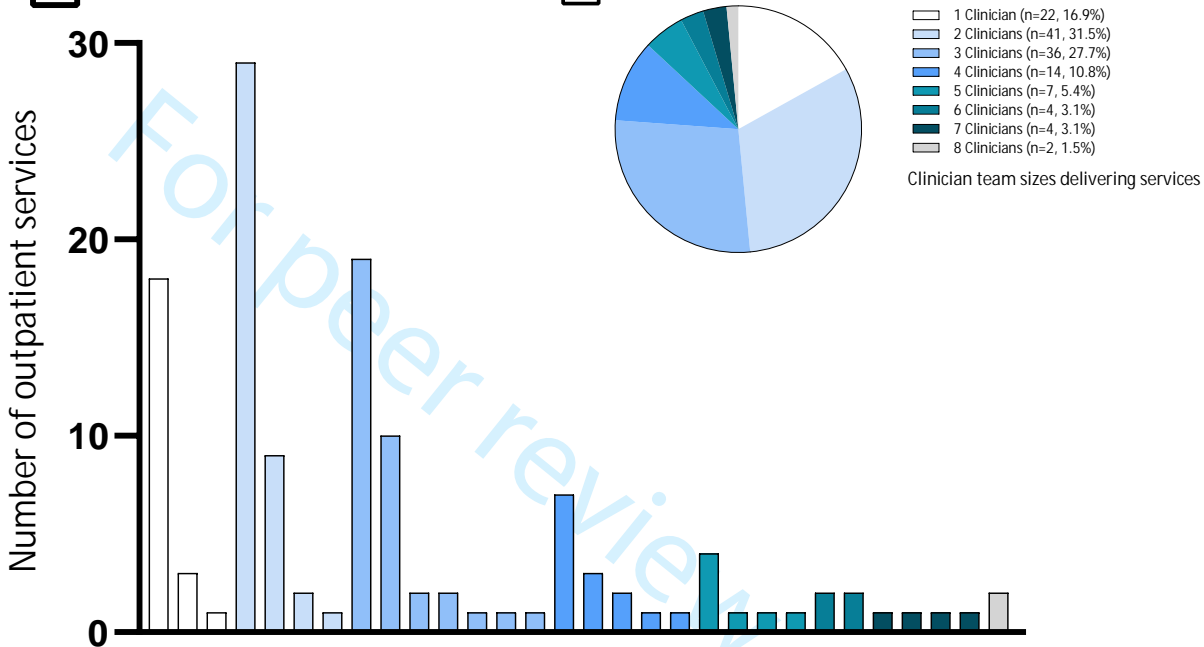
**Table 4.** Themes characterising future plans for service development in next 2-5 years

Theme	Frequency of occurrence (/176) (n (%))
Expand current outpatient services	46 (26.1)
Start new outpatient service	40 (22.7)
Start new psychology service	23 (13.1)
Expand current inpatient services	23 (13.1)
Start new inpatient service	19 (10.8)
Start new exercise rehabilitation programme	13 (7.4)
Maintain current services	13 (7.4)
Establish new pathways with rehabilitation and specialist services	4 (2.3)
Nil specified	46 (26.7)

**A**

**B**

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	n (%)
Nurse	121 (93.1)
ICU physician	100 (76.9)
ST	65 (50.0)
OT	14 (10.8)
Psychologist	36 (27.7)
Psychiatrist	3 (2.3)
SLT	9 (6.9)
GRA	1 (0.8)
Dietitian	11 (8.5)
Pharmacist	10 (7.7)
GP	1 (0.8)

	1 clinician	2 clinicians	3 clinicians	4 clinicians	5 clinicians	6	7 clinicians	8
Nurse	•	• •	• • •	• • • •	• • • •	• • • •	• • • •	• • • •
ICU physician	•	• • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • • •
ST	•	• • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • • •
OT		• • •	• • • •	• • • •	• • • •	• • • •	• • • •	• • • •
Psychologist			• • • •	• • • •	• • • •	• • • •	• • • •	• • • •
Psychiatrist			•	•	•	•	•	•
SLT				•	•	•	•	•
GRA				•				
Dietitian				•	•	•	•	•
Pharmacist					•	•	•	•
GP								•



## A UK wide survey of recovery and follow-up services following adult critical illness

### A UK wide survey of recovery and follow-up services following adult critical illness

**You are invited to participate in this cross-sectional survey to describe recovery and follow-up services available for adult critical care patients across the UK. We wish to collect information about services normally delivered at your organisation, and that were/are in place *prior* to the COVID-19 pandemic. There is opportunity to describe any changes in services as a result of the pandemic at the end of the survey.**

**Please read the accompanying Participant Information Sheet before progressing to complete this survey. This study has been approved by King's College London (MRA-19/20-17855), and completion of this survey implies your consent to participation.**

#### **Why is the survey being done?**

**The aims of the survey are:**

- 1. To evaluate the provision of recovery and follow-up services for adult critical care patients in line with NICE CG83 guidance**
- 2. To characterise these services in terms of location, content, format, structure, resource and funding**
- 3. To explore factors influencing availability of these services**

**This survey will be an update of an earlier published one (Connolly et al, BMJ Open, 2014, 4, e004963). For additional reference, please see the NICE CG83 'Rehabilitation After Critical Illness' Guidelines <https://www.nice.org.uk/Guidance/CG83>, and Quality Standards <https://www.nice.org.uk/guidance/QS158>.**

#### **What will the data be used for?**

**The findings will inform the Life After Critical Illness Workstream being undertaken by the Faculty of Intensive Care Medicine (Chair, Dr Carl Waldmann). Survey findings will be shared with the Faculty of Intensive Care Medicine for this purpose. Findings will also be disseminated in a peer-reviewed journal publication; these will be anonymous.**

**The overall goal of this work is to influence the development of robust, equitable, and well-resourced critical illness recovery and follow-up services across the UK.**

#### **How will the survey be done?**

**The survey should take approximately 30-45 minutes to complete, depending on the available services at your organisation; if you do not have any available services, completion time will be much quicker.**

**Questions will cover:**

- 1. Detail of your organisation and critical care services**
- 2. Provision of recovery and follow-up services on the ward following critical care discharge**
- 3. Provision of recovery and follow-up services after hospital discharge**

1  
2 **The survey questions are designed to collect information about all aspects of available follow-up**  
3 **services. We envisage that you will act as a principal responder/representative to coordinate the**  
4 **survey response at each organisation. You are encouraged to liaise with relevant multi-professional**  
5 **colleagues to provide full and accurate responses.**  
6  
7

8 **As the scope of services are known to be broad and diverse, completion of the free-text spaces for**  
9 **details not captured by the survey questions is encouraged.**  
10

11 **We would also like to potentially contact you in the future regarding the information you have**  
12 **provided in this survey (this is included in the consent to participate section). Do be sure to**  
13 **understand this section before submitting your full survey.**  
14  
15

16 **If you have any questions relating to the survey or its completion, please contact:**  
17  
18

19 **Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)**

20 **Dr. Joel Meyer (for the FICM, Joel.Meyer@gstt.nhs.uk)**  
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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 1: Lead Respondent Details

1. Name

2. Role/Job title

3. Place of Work

4. Email

5. Phone Number



## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 2: Adult Critical Care and Follow-Up Services at your institution

Please begin by telling us about your organisation and its adult critical care services.

\* 6. What is the name of your NHS Hospital?

\* 7. Type of hospital

- University-affiliated
- District general
- Specialist centre
- Other (please specify)

\* 8. Total number of Level 3 critical care beds

\* 9. Total number of Level 2 critical care beds

\* 10. Estimated annual Level 3 critical care admissions

\* 11. Please indicate all the specialist critical care services available at your hospital (Tick all that apply)

- |   |                                 |
|---|---------------------------------|
| <input type="checkbox"/> General (mixed)        | <input type="checkbox"/> Trauma |
| <input type="checkbox"/> Neurology/Neurosurgery | <input type="checkbox"/> ECMO   |
| <input type="checkbox"/> Cardiothoracic         | <input type="checkbox"/> Burns  |
| <input type="checkbox"/> Liver                  | <input type="checkbox"/> Spinal |
| <input type="checkbox"/> Other (please specify) |                                 |

1 \* 12. Many hospitals now offer recovery and follow up services for adult critically ill patients (separate to any  
2 defined specialty-specific pathways such as cardiac, trauma, or neuro- rehabilitation). For example:  
3

- 4 · *Inpatient/ward service*
- 5 · *Outpatient clinic*
- 6 · *Outpatient group programme*
- 7 · *Exercise/rehab class*
- 8 · *Peer support group*
- 9 · *Telephone/telehealth follow up*
- 10 · *MDT meeting independently of patient*
- 11 · *Web-based interface*
- 12 · *Postal survey*
- 13 · *Community-based*
- 14
- 15
- 16
- 17

18 Pre-COVID, if you normally DO offer any such recovery or follow up services at your hospitals please tick Yes  
19 and move on to the next question  
20

21 If you DO NOT offer such services please tick No and then progress to Section 3.

22  Yes

23  No

24  
25  
26  
27  
28 If you answered Yes to Q12, please use sections 13-17 to tell us about each type of service that you offer; use a separate section for  
29 each component  
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### 13. Recovery/Follow Up Service 1

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow*

*up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

### 14. Recovery/Follow Up Service 2

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow*

*up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

1 15. Recovery/Follow Up Service 3

2 Name given to your  
3 service

4  
5 Which of the following  
6 descriptors best describes  
7 this service?

8 *Inpatient/ward service*

9 *Outpatient clinic*

10 *Outpatient group*

11 *programme*

12 *Exercise/rehab class*

13 *Peer support group*

14 *Telephone/telehealth follow*

15 *up*

16 *MDT meeting*

17 *independently of patient*

18 *Web-based interface*

19 *Postal survey*

20 *Community-based*

21 Which patients and which  
22 units does it include? (NB:  
23 Specific eligibility criteria  
24 covered later)

25 *All critical care patients*

26 *A subset of patients only*

27 *Other (please specify)*

29  
30 16. Recovery/Follow Up Service 4

31 Name given to your  
32 service

33  
34 Which of the following  
35 descriptors best describes  
36 this service?

37 *Inpatient/ward service*

38 *Outpatient clinic*

39 *Outpatient group*

40 *programme*

41 *Exercise/rehab class*

42 *Peer support group*

43 *Telephone/telehealth follow*

44 *up*

45 *MDT meeting*

46 *independently of patient*

47 *Web-based interface*

48 *Postal survey*

49 *Community-based*

50  
51 Which patients and which  
52 units does it include? (NB:  
53 Specific eligibility criteria  
54 covered later)

55 *All critical care patients*

56 *A subset of patients only*

57 *Other (please specify)*

## 17. Recovery/Follow Up Service 5

Name given to your service

Which of the following descriptors best describes this service?

*Inpatient/ward service*

*Outpatient clinic*

*Outpatient group*

*programme*

*Exercise/rehab class*

*Peer support group*

*Telephone/telehealth follow up*

*MDT meeting*

*independently of patient*

*Web-based interface*

*Postal survey*

*Community-based*

Which patients and which units does it include? (NB: Specific eligibility criteria covered later)

*All critical care patients*

*A subset of patients only*

*Other (please specify)*

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 3: Transferring from Critical Care to a Hospital Ward

\* 18. What is the process of discharge from critical care to hospital ward? (Tick all that apply)

Face to face handover

Telephone handover

Written handover

Other (please specify)

\* 19. What is included in the discharge process? (Tick all that apply)

Medical handover

Psychological/cognitive rehabilitation plan

Nursing handover

Nutritional plan

Medicines reconciliation

Occupational Therapy plan

Physical rehabilitation plan

Speech and Language therapy plan

Other (please specify)

\* 20. In what form is the critical care discharge summary provided to the ward team?

Paper

Digital

Both

\* 21. Is a critical care discharge summary sent to the General Practitioner at this stage?

Yes

No

## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 4: Inpatient/Hospital Ward Services

We would now like to understand about inpatient/ward services for adult critically ill patients i.e. services applying to the period between critical care discharge and discharge from hospital.

\* 22. Do you provide inpatient follow-up services in the general wards after discharge from critical care?

Yes

No

If No, please state reasons why and then progress to Section 5

\* 23. For how long has this service been implemented?

0

Years

30



24. By what name is this service known? (If applicable)



1 \* 25. What form does this inpatient contact take? (Tick all that apply)

- 2  Outreach/rapid response (focussed on readmission prevention)
- 3  Peer support
- 4  Outreach/rapid response (focussed on outcomes)
- 5  Information provision
- 6  Generic rehabilitation assistant/care coordinator
- 7  Psychological intervention
- 8  Intensivist/AHP/nurse ward round
- 9  Research/academic contact
- 10  Formal MDT meeting
- 11  Engagement/education of ward staff about post ICU problems
- 12  Family support
- 13  Other (please specify)

14

15

16

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19 \* 26. What criteria are used to select patients for inpatient follow-up? (Tick all that apply)

- 20  All patients
- 21  Diagnosis at critical care admission
- 22  Length of stay critical care (if based on this, indicate number in Other section)
- 23  Self-referral
- 24  Clinician/ward referral
- 25  Days of mechanical ventilation (if based on this, indicate number in Other section)
- 26
- 27  Type of therapies received during critical care admission
- 28
- 29  Other (please specify)
- 30

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39 \* 27. Are any specific categories of patients excluded?

40

41

42

43 \* 28. How are referrals for inpatient follow-up monitored?

- 44  Automated process
- 45  EPR generated list
- 46  Ad hoc patient list/spreadsheet
- 47  Other (please specify)
- 48
- 49
- 50
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\* 29. Which professions provide the inpatient service? (Tick all that apply)

- |   |  |
|---|--|
| <input type="checkbox"/> Administrator                    | <input type="checkbox"/> Pharmacist                    |
| <input type="checkbox"/> Dietitian                        | <input type="checkbox"/> Physiotherapist               |
| <input type="checkbox"/> Generic rehabilitation assistant | <input type="checkbox"/> Psychiatrist                  |
| <input type="checkbox"/> Intensivist                      | <input type="checkbox"/> Psychologist                  |
| <input type="checkbox"/> Nurse                            | <input type="checkbox"/> Social Worker                 |
| <input type="checkbox"/> Occupational Therapist           | <input type="checkbox"/> Speech and Language Therapist |
| <input type="checkbox"/> Other (please specify)           |  |

\* 30. What is the profession of the person who leads this inpatient service?

\* 31. Is there any profession missing from the inpatient service that you would ideally include?

\* 32. How is this inpatient follow-up service funded?

- |  |  |
|--|--|
| <input type="radio"/> NHS funding e.g. commissioned service or other sustained NHS funding route | <input type="radio"/> Grant funding – dedicated grant for this activity            |
| <input type="radio"/> Funded internally from existing critical care funds                        | <input type="radio"/> Grant funding – allied to other ICU-related research studies |
| <input type="radio"/> Other internal institutional funding (specify in Other Section)            | <input type="radio"/> Volunteer/goodwill only                                      |
| <input type="radio"/> Other (please specify)   |  |

\* 33. Do you use a screening tool for post intensive care issues?

- Yes
- No

If Yes please describe briefly

1 \* 34. Describe the major challenges delivering and sustaining this inpatient service?  
2

- 3  Time  
4  Staffing number  
5  Staffing profile  
6  Environment  
7  Patient location  
8  Other (please specify)  
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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 5: Outpatient Services following Hospital Discharge

We would now like to understand about outpatient services for adult critically ill patients i.e. services delivered following discharge from hospital.

\* 35. Do you provide follow-up services for adult critically ill patients following discharge from hospital?

Yes

No

If No please state reasons why and then progress to Section 6

\* 36. For how long has this service been implemented?

0

Years

30



37. By what name is this service known? (if applicable)

\* 38. How many 'new' patients attend per year (estimate)?

\* 39. How many 'follow-up' patients (i.e. subsequent visits) attend per year (estimate)?

\* 40. When does the follow-up first occur?

1 month after discharge from hospital

2-3 months after discharge from hospital

6 months after discharge from hospital

Other (please specify)

1 \* 41. What criteria are used to select patients for outpatient follow-up? (Tick all that apply)

- 2  All patients  Based on diagnosis
- 3
- 4  Length of stay critical care (if based on this, indicate number in  Self-referral
- 5 Other Section)
- 6  Clinician referral
- 7  Days of mechanical ventilation (if based on this, indicate
- 8 number in Other Section)
- 9  Based on therapies received
- 10
- 11  Other (please specify)
- 12

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20 \* 42. Are any specific categories of patients excluded?

21

22

23

24

25 \* 43. How are eligible patients identified? (Tick all that apply)

- 26  Automated IT process generates the list  EPR request for clinic appointment
- 27
- 28  Review of care records  Blanket invitation (no triage)
- 29
- 30  Manual/active triage of all critical care discharges  Verbal clinician referral
- 31
- 32  Local database
- 33
- 34  Other (please specify)
- 35

36

37

38

39 \* 44. Do you accept patients outside of your hospital or region to attend the service?

- 40  Yes
- 41
- 42  No
- 43
- 44  Additional Comments
- 45

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1 \* 45. How are patients tracked until their appointment?  
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- 4  Automated process  
5  EPR generated list  
6  Ad hoc patient list/spreadsheet  
7  Other (please specify)

8  
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12 \* 46. How are patients contacted/invited? (Tick all that apply)  
13

- 14  Telephone call  
15  Postal letter  
16  Given appointment prior to hospital discharge  
17  Text reminder  
18  Other (please specify)

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24 \* 47. Which professions provide the outpatient service? (Tick all that apply)  
25  
26

- 27  Administrator  Pharmacist  
28  Dietitian  Physiotherapist  
29  Generic rehabilitation assistant  Psychiatrist  
30  GP  Psychologist  
31  Intensivist  Social Worker  
32  Nurse  Speech and Language Therapist  
33  Occupational Therapist  
34  Other (please specify)

35  
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40 \* 48. What is the profession of the person who leads this outpatient service?  
41

42   
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44

45 \* 49. Is there any professions missing from the outpatient service that you would ideally include?  
46

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48  
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1 \* 50. How is this outpatient service funded?  
2  
3

- 4  NHS funding e.g. commissioned service or other sustained NHS funding route  
5  Funded internally from existing critical care funds  
6  Other internal institutional funding (specify in Other section)  
7  Grant funding – dedicated grant for this activity  
8  Grant funding – allied to other ICU-related research studies  
9  Volunteer/goodwill only  
10  
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13 Other (please specify)

14   
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19  
20 \* 51. What is the approximate tariff per patient [OR if tariffs not applicable to your region what is the  
21 approximate annual cost of running the outpatient service]?

22   
23  
24

25  
26 \* 52. Where is the follow-up service located?

- 27  Dedicated hospital outpatient area  
28  Adapted space within critical care  
29  Other area within the hospital  
30  Community site  
31  Other (please specify)  
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40 \* 53. How many clinic rooms are required to deliver the service? (Number and any other comments)

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44  
45

46 \* 54. If the patient is assessed by multiple healthcare professionals, do these encounters happen...

- 47  Together (i.e. all healthcare professionals in the same room)  
48  Separately (i.e. healthcare professionals in different rooms)  
49  
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1 \* 55. On average, what is the overall duration of a 'New' patient's appointment?  
2  
3

- 4  <30 minutes  2 – 2.5 hours  
5  30 minutes – 1 hour  2.5 – 3 hours  
6  1 - 1.5 hours  >3 hours  
7  
8  1.5 – 2 hours  
9  
10  Other (please specify)

11   
12

13  
14 \* 56. On average, what is the overall duration of a subsequent 'Follow up' patient's appointment?  
15

- 16  <30 minutes  2 – 2.5 hours  
17  30 minutes – 1 hour  2.5 – 3 hours  
18  1 - 1.5 hours  >3 hours  
19  
20  1.5 – 2 hours  
21  
22  Other (please specify)

23   
24  
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28 \* 57. What is the maximum number of visits patients can have?  
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\* 58. What interventions are typically delivered in your outpatient follow-up service? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Physical function assessment                      | <input type="checkbox"/> Family/Caregiver needs assessment                 |
| <input type="checkbox"/> Physiotherapy referral if required                | <input type="checkbox"/> Employment/occupation review                      |
| <input type="checkbox"/> Cardiac/respiratory/exercise referral if required | <input type="checkbox"/> Assessment of financial status                    |
| <input type="checkbox"/> Occupational function assessment                  | <input type="checkbox"/> Social needs assessment                           |
| <input type="checkbox"/> Occupational Therapy referral if required         | <input type="checkbox"/> Review of goals and preferences of care           |
| <input type="checkbox"/> Psychiatric assessment                            | <input type="checkbox"/> Review of ICU history and ICU events with patient |
| <input type="checkbox"/> Psychological assessment                          | <input type="checkbox"/> Patient visit to ICU                              |
| <input type="checkbox"/> Clinical psychology referral if required          | <input type="checkbox"/> Return/review of ICU diary                        |
| <input type="checkbox"/> Cognitive assessment                              | <input type="checkbox"/> Assessment of sexual function                     |
| <input type="checkbox"/> Nutritional assessment                            | <input type="checkbox"/> Assessment of sleep                               |
| <input type="checkbox"/> Dietitian referral if required                    | <input type="checkbox"/> Travel assessment e.g. driving, airline flight    |
| <input type="checkbox"/> Speech and language assessment                    | <input type="checkbox"/> Vital signs/observations                          |
| <input type="checkbox"/> Speech and Language Therapy referral if required  | <input type="checkbox"/> Physical examination                              |
| <input type="checkbox"/> Pharmacy review                                   | <input type="checkbox"/> Immunisation review                               |
| <input type="checkbox"/> Lifestyle/risk factor review                      |  |
| <input type="checkbox"/> Other (please specify)                            |  |

\* 59. For the following domains, please give the name of any validated outcome measure(s) or tool(s) used in your service, if any? Where able please explain why the measure has been chosen/implemented?

Anxiety

Depression

Post-traumatic stress disorder

Sleep quality

Sleep apnoea

Cognition

Health-related quality of life

Personal Activities of Daily Living

Pain

Breathlessness

Palliative care needs

Sexual function

Nutritional status

Physical function

Exercise capacity

Disability

Frailty

Dependency

Socioeconomic status

Pharmacological risk

Alcohol intake

Smoking status

Driving status

Flying status

Additional Comments

1 \* 60. Do you use a screening tool for post intensive care issues?  
2  
3

4  Yes  
5

6  No

7 If Yes please describe briefly  
8  
9

10   
11  
12

13 \* 61. Describe the major challenges delivering and sustaining this outpatient adult critical care recovery  
14 service?

15  Time

Managerial engagement

17  Funding

Staff engagement

19  Personnel

Perceived value or priority

21  Space

Pressures from other services

23  Other (please specify)  
24

25   
26  
27

28 \* 62. To what extent do you agree that your current outpatient service meets the needs of your casemix?  
29

30  Strongly agree

31  Agree

32  Neither agree or disagree

33  Disagree

34  Strongly disagree  
35  
36  
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40 \* 63. What is lacking to make it fully fit for purpose?  
41

42  Physical space

43  Increased personnel

44  Commissioned funding

45  Administrative support

46  Other (please specify)  
47  
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1 \* 64. To what extent do you agree that your existing funding/venue/staff/resource/service model is sustainable  
2 over next 5 years?

- 3  Strongly agree  
4  
5  Agree  
6  
7  Neither agree or disagree  
8  
9  Disagree  
10  
11  Strongly disagree  
12

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14 \* 65. What would help with sustaining the service?

- 15  Physical space  
16  
17  Increased personnel  
18  
19  Commissioned funding  
20  
21  Administrative support  
22  
23  Other (please specify)

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 6: Links and Future Plans - All Respondents

\* 66. Please tell us about any links or collaborations between your adult critical care service and recovery/follow-up services in neighbouring institutions (e.g. informal links for advice, formal hub and spoke network, established referral pathways etc)?

\* 67. Please tell us about any links you have established between your critical care services and the primary care interface or community interface?

\* 68. Please tell us about any links between your adult service and services for paediatric patients; adolescent patients; and those transitioning to adult services?

\* 69. Please tell us about any links with services for the care of the older person?

\* 70. What is being planned in your institution in terms of instigation, development, or expansion of adult critical care recovery services in the next 2-5 years?

1 \* 71. If you previously answered that you DO NOT offer any recovery and follow up services for adult critically ill  
2 patients within your Trust/institution, please could you give the main reasons for this? (Tick all that apply)

- 3  Lack of sufficient staff numbers  Insufficient patient numbers to justify
- 4  Lack of suitably trained staff  Not sure what to include in a service
- 5  Lack of available space/venue  Resources prioritised to other patient groups/clinical areas
- 6  No evidence to suggest benefit  Extra-contractual (out-of-area) patient caseload
- 7  Lack of funding  Not applicable - service are available
- 8  Not considered required service at managerial level
- 9  Other (please specify)

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20 \* 72. Do you have any web-based links / sites / information resources for recovering critical care patients and  
21 caregivers?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 7: Peer Support after Critical Illness

\* 73. Do you offer peer support services for adult critical care patients/relatives?

Yes

No

\* 74. What format does this peer support take?

Community or hospital-based support group meetings after discharge

Psychologist-led outpatient groups

Peer support based within ICU follow-up clinics

Online peer support

Groups based within the ICU

Peer mentor led

Other (please specify)

\* 75. How many times per year does this peer support occur?

\* 76. What is the average attendance of former patients?

\* 77. What is the average attendance of relatives/caregivers?

1 \* 78. What is the staffing input into these groups? (Tick all that apply)

- 2  None/peer-facilitated only
- 3
- 4  Critical care nurse
- 5
- 6  Intensivist
- 7
- 8  AHP
- 9
- 10  Psychologist
- 11  Other (please specify)
- 12

13

14

15

16 \* 79. What is the format of the peer support session?

- 17
- 18  Structured agenda with talks/presentations
- 19
- 20  Therapy session
- 21
- 22  Facilitated discussion
- 23
- 24  Informal meeting
- 25
- 26  Drop in
- 27
- 28  Virtual
- 29  Other (please specify)
- 30

31

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34 \* 80. Is your peer support programme affiliated to any networks, for example ICU Steps or Society of Critical  
35 Care Medicine Thrive Initiative?

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## A UK wide survey of recovery and follow-up services following adult critical illness

### Section 8: Physical rehabilitation programmes after hospital discharge

\* 81. Do you provide a physical rehabilitation programme post hospital discharge specifically for post critical illness patients as part of *routine* clinical practice? (separate to generic services such as intermediate care, supported discharge, hospital-at-home or similar)

Yes

No

\* 82. Who is responsible for leading this rehabilitation programme? (Tick all that apply)

Exercise/sports Therapist

Occupational Therapist

Doctor

Physiotherapist

Nurse

Rehabilitation Medicine specialist

Other (please specify)

\* 83. Is this healthcare professional...

ICU specialist

Rehabilitation specialist

1 \* 84. How do you select patients for inclusion into the programme? (Tick all that apply, and give details of any  
 2 assessment measures if applicable in the comments section)

- 3  Duration of mechanical ventilation in ICU  Health-related quality of life at ICU discharge  
 4  Duration of ICU admission  Physical function at hospital discharge  
 5  Duration of hospital admission  Muscle strength at hospital discharge  
 6  Physical function at ICU discharge  Exercise capacity at hospital discharge  
 7  Muscle strength at ICU discharge  Health-related quality of life at hospital discharge  
 8  Exercise capacity at ICU discharge  Not applicable – all post critical care patients are eligible  
 9  Other (please specify)

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23 \* 85. Where does the patient receive the majority of the intervention?

- 24  Home-based  
 25  Hospital-based  
 26  Community-based  
 27  Other (please specify)

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35  
36 \* 86. Do you use telehealth or other interactive forms of intervention delivery?

- 37  Yes  
 38  No

39 If YES, please give details

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50 \* 87. Does your rehabilitation programme include an exercise component?

- 51  Yes  
 52  No

## A UK wide survey of recovery and follow-up services following adult critical illness

\* 88. Do patients exercise:

- Under supervision
- Independently
- Combination
- Other (please specify)

\* 89. Do patients exercise in a:

- Pre-determined circuit
- Patient-specific plan
- Other (please specify)

\* 90. What exercises are included (Tick all that apply)?

- Cardiovascular e.g. step-ups, treadmill, bike
- Strength e.g. lower limb, upper limb, free weights
- Balance e.g. static, dynamic
- Functional e.g. sit-to-stand, walking
- Other (Please specify)

\* 91. How are these exercises prescribed? (Tick all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> Results of walking tests                | <input type="checkbox"/> Target heart rate  |
| <input type="checkbox"/> Results of balance assessment           | <input type="checkbox"/> Target level of exertion e.g. Borg scale (please specify range in Other section) |
| <input type="checkbox"/> Results of physical function assessment | <input type="checkbox"/> Clinician judgement  |
| <input type="checkbox"/> Repetition maximum principle            |   |
| <input type="checkbox"/> Other (please specify)                  |   |

\* 92. How do you monitor and/or progress exercise intensity during the exercise session? (Tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Heart rate targets                | <input type="checkbox"/> Clinical observation/judgement of patient |
| <input type="checkbox"/> SpO2                              | <input type="checkbox"/> Patient verbal feedback                   |
| <input type="checkbox"/> Level of exertion e.g. Borg scale | <input type="checkbox"/> No formal monitoring                      |
| <input type="checkbox"/> Visual analogue scale             | <input type="checkbox"/> Reassessment of baseline measures         |
| <input type="checkbox"/> Other (please specify)            |  |

\* 93. In your programme, do you use an accompanying rehabilitation or exercise manual?

- Yes
- No

\* 94. Is your programme:

A stand-alone programme  
for post critical illness  
patients

Part of existing  
rehabilitation services  
including patients with  
other disease groups, if so  
which

Other (please specify)

1 \* 95. At what time point post hospital discharge does the programme commence:  
2  
3

- 4  Immediately post hospital discharge  One month post hospital discharge  
5  One week post hospital discharge  2-3 months post hospital discharge  
6  Two weeks post hospital discharge  
7  Other (please specify)  
8

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13 \* 96. Does your service have a waiting list?

- 14  Yes  
15  
16  No  
17

18 If Yes, how long?

19

20  
21  
22  
23 \* 97. Does your service have sufficient capacity to meet demand?

- 24  Yes  
25  
26  No  
27

28  
29 \* 98. How many sessions are in the rehabilitation programme?  
30

31

32  
33  
34 \* 99. How often are the sessions?

- 35  Weekly  
36  
37  Twice-weekly  
38  
39  Fortnightly  
40  
41  Other (please specify)  
42

43

44  
45  
46 \* 100. How long is each session?

- 47  30 minutes  
48  
49  45 minutes  
50  
51  1 hour  
52  
53  Other (please specify)  
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\* 101. Is this a:

- Rolling programme
- Stand alone

Additional Comments

\* 102. How many patients are in the group?

\* 103. What is the staff:patient ratio?

\* 104. Does your physical rehabilitation programme include an education component?

- Yes
- No



A UK wide survey of recovery and follow-up services following adult critical illness

\* 105. What topics are included (and list which MDT members delivers them)

Exercise	<input type="text"/>
Stress management	<input type="text"/>
Nutrition	<input type="text"/>
Return to work	<input type="text"/>
Energy conservation	<input type="text"/>
Medications	<input type="text"/>
What to expect of recovery	<input type="text"/>
Motivational coaching/training	<input type="text"/>
Other (please specify)	<input type="text"/>

\* 106. What outcome measures do you use with patients participating in your rehabilitation programme?

Please specify detail...

Strength-based e.g. repetition maximum	<input type="text"/>
Exercise capacity e.g. field walking tests (e.g. 6 Minute Walk Test, cardiopulmonary exercise testing (VO2max)	<input type="text"/>
Health-related quality of life e.g. SF-36 survey, Hospital Anxiety and Depression scale	<input type="text"/>
Mental/cognitive assessment e.g. Montreal Cognitive Assessment	<input type="text"/>
Functional performance e.g. Timed Up and Go, Short Physical Performance Battery	<input type="text"/>
Other (please specify)	<input type="text"/>

1 \* 107. Do you refer ICU patients routinely into other rehabilitation programmes/services, either in-patient or  
2 community-based?  
3

4  Yes

5  No  
6  
7

8 \* 108. If YES.... which type? (Tick all that apply)  
9

10  Pulmonary rehabilitation

11  Cardiac rehabilitation

12  Exercise on prescription (or similar)

13  Community gym sessions

14  Other (please specify)  
15  
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22 109. Any other comments regarding your post critical illness physical rehabilitation programme?  
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## A UK wide survey of recovery and follow-up services following adult critical illness

\* 110. Please indicate the barriers to delivering a post hospital discharge physical rehabilitation programme (Tick all that apply)

- |   |   |
|---|---|
| <input type="checkbox"/> Lack of funding  | <input type="checkbox"/> Extracontractual (out of area) patient caseload              |
| <input type="checkbox"/> Lack of sufficient staff                                     | <input type="checkbox"/> Lack of trained staff  |
| <input type="checkbox"/> Resources prioritised to other patient groups/clinical areas | <input type="checkbox"/> No evidence to demonstrate rationale/requirement for service |
| <input type="checkbox"/> Not considered required service at managerial level          | <input type="checkbox"/> Not sure what content to include in a programme              |
| <input type="checkbox"/> Lack of available space                                      | <input type="checkbox"/> Time constraints   |
| <input type="checkbox"/> Insufficient patient numbers to justify                      |   |
| <input type="checkbox"/> Other (please specify)                                       |   |

111. From the list above, please indicate the MAIN barrier that applies



A UK wide survey of recovery and follow-up services following adult critical illness

Impact of COVID-19 on recovery and follow-up services following critical illness

\* 112. Please tell us of any changes to existing services, if applicable, or development of any new services, as a result of COVID-19; for example in relation to timing, structure, format, and content, of delivery, the number of healthcare professionals involved etc

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## A UK wide survey of recovery and follow-up services following adult critical illness

### End of survey

Thank you for completing this survey and once again if you have any questions relating to the survey or its completion, please contact:

Dr. Bronwen Connolly (Bronwen.connolly@nhs.net)

Dr. Joel Meyer (Joel.Meyer@gstt.nhs.uk)

1  
2  
3 1 **Recovery, rehabilitation, and follow-up services following critical illness: an updated UK national**  
4  
5 2 **cross-sectional survey and progress report**  
6  
7  
8 3

9 4 **Bronwen Connolly<sup>1, 2, 3, 4</sup>, Rhian Milton-Cole<sup>2</sup>, Claire Adams, Ceri Battle, Jo McPeake, Tara Quasim,**  
10  
11 5 **Jon Silversides, Andrew Slack<sup>5</sup>, Carl Waldmann, Elizabeth Wilson, Joel Meyer<sup>5</sup> on behalf of the**  
12  
13 6 **Faculty of Intensive Care Medicine Life After Critical Illness Working Group**  
14  
15 7

16 8 **ONLINE DATA SUPPLEMENT**  
17  
18 9  
19  
20 10

21 11 **E1. Discharge process from critical care to hospital ward**

22  
23 12 The discharge process for patients transferring from critical care to the hospital ward is a written  
24  
25 13 handover in 90.9% (n=160/176) of institutions, commonly accompanied by telephone (n=120/176,  
26  
27 14 68.2%) or face-to-face (n=118/176, 67.0%) handover. Domains contained within the handover  
28  
29 15 document include nursing (n=174/176, 98.9%), medical (n=167/176, 94.9%), physical rehabilitation  
30  
31 16 (n=145/176, 82.4%), nutritional management (n=141/176, 80.1%), medicines' reconciliation  
32  
33 17 (n=121/176, 68.8%), and speech and language therapy plan (n=102/176, 58.0). In the majority of cases  
34  
35 18 (n=157/176, 89.2%) respondents reported using more than one delivery process for patients, with  
36  
37 19 either paper (n=79/176, 44.9%), digital (n=35/176, 19.9%), or both (n=62/176, 35.2%) forms of  
38  
39 20 delivery used. Less frequently reported components of handover included psychology/cognitive  
40  
41 21 rehabilitation (n=49/176, n=27.8%) and occupational therapy (n=44/176, 25.0%). Other reported  
42  
43 22 content (n=11/176, 6.3%) included outreach liaison, social work, and any specific individual aspects of  
44  
45 23 care. A critical care discharge summary is sent to patients' primary care physician in 74 (/176, 42.0%)  
46  
47 24 of institutions.  
48  
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## E2. Inpatient recovery and follow-up services

Of 127 targeted inpatient recovery and follow-up services, most were led by nursing staff (n=65/127, 51.2%, n=4 missing responses), with just over one quarter led by the multi-professional team (n=36/127, 28.3%), and a small proportion by ICU physicians (n=16/127, 12.6%). Physiotherapists (n=3) and rehabilitation co-ordinators (n=1) were reported in a minority of cases (both /127,  $\leq 3.0\%$ ).

The most frequently reported professions missing from inpatient services were psychology (n=55/127, 43.3%), occupational therapy (n=29/127, 22.8%), and physical therapy (n=18/127, 14.2%). Other missing professions were reported as follows: Medical (n=11/127, 8.7%), speech and language therapy (n=11/127, 8.7%), dietetics (n=10/127, 7.9%), and in a minority of cases, nursing, psychiatry, rehabilitation assistants, social workers, pharmacists, cognitive behavioural therapy, occupation health, advanced critical care practitioners, and administrators (all  $\leq n=5/127, \leq 4.0\%$ ). Eleven and 2 respondents respectively reported the whole multi-professional team, and 'All allied health professionals' as missing from services. Twenty-three respondents (/127, 18.1%) reported that there were no professions missing from their services.

### 69 E3. Outpatient recovery and follow-up services

70 One hundred and thirty respondents (/176, 73.9%) reported providing outpatient (following hospital  
71 discharge) recovery and follow-up services for adult post critical illness patients. Additional reasons  
72 for excluding patients from services (all  $n \leq 3$  respondents) included: cardiothoracic/cardiology  
73 diagnoses, neurological diagnoses, dementia/cognitive impairment, diagnosis of an overdose,  
74 requiring home mechanical ventilation, residing out of geographical hospital area, discharged to a  
75 residential or nursing home, other specialist rehabilitation pathway in place, prisoners, elective  
76 surgery, aged >75 years, previous non-attendance. Whilst ICU physician and nursing staff were the  
77 most frequently reported staff leading services, a small number of other professions/teams were  
78 detailed by respondents: joint ICU physician and nurse ( $n=7$ ), multi-professional team ( $n=4$ ), joint ICU  
79 physician and psychologist ( $n=2$ ), and physiotherapist, joint advanced critical care practitioner and  
80 physiotherapist, surgeon, joint ICU physician and physiotherapist, and joint nurse and physiotherapist  
81 (all  $n=1$ ).

82  
83 The majority ( $n=108/130$ , 83.1%) of services involved 2 or more healthcare professions, with further  
84 breakdown according to number of healthcare professions involved; 1, ( $n=22$ ), 2 ( $n=41$ ), 3, ( $n=36$ ), 4  
85 ( $n=14$ ), 5 ( $n=7$ ), 6 ( $n=4$ ), 7 ( $n=4$ ), 8 ( $n=2$ ). Combinations of healthcare professions providing services  
86 are reported in Table E1. The most frequently reported professions missing from outpatient services  
87 were psychology ( $n=61/130$ , 46.9%), physiotherapy ( $n=45/130$ , 34.6%), occupational therapy  
88 ( $n=41/130$ , 31.5%), and dietetics and speech and language therapy (both  $n=22/130$ , 16.9%). Less  
89 frequently reported missing professions included intensive care medicine and pharmacy (both  
90  $n=11/130$ , 8.5%), social work ( $n=7/130$ , 5.4%). A minority of respondents reported psychiatry,  
91 administrative support, nursing, the multi-professional team, rehabilitation team, primary care  
92 physician, pain team, occupational health, counsellor, wellbeing services, and service improvement  
93 team, as professions missing from outpatient services (all  $n \leq 4/130$ ,  $\leq 3.1\%$ ). Clinic rooms available  
94 for services typically ranged 1-4. Subsequent appointments, after the initial one, typically ranged  
95 between 1 and 3, but some respondents reported no limits on the number of repeat visits patients  
96 could have.

97  
98 Seventy-six respondents (/130, 58.5%) reported using some form of screening tool for post intensive  
99 care issues; specifically named tools were not always provided but where they were these included  
100 the Chelsea Critical Care Physical Assessment Tool, Intensive Care Psychological Assessment Tool,  
101 Hospital Anxiety and Depression Scale, Post-Traumatic Stress Symptoms-14 scale, Short-Form 36.  
102 Where specific tools were not listed respondents reported use of their own locally developed

1  
2  
3 103 proformas and concerns checklists, and rating scales (e.g. distress thermometer), and/or indicated the  
4  
5 104 broad domains they assessed e.g. activities of daily living, psychological status. Eight-five respondents  
6  
7 105 gave examples of outcome measures or tools to assess aspects of critical illness recovery, which are  
8  
9 106 summarised in Table E2.

10 107  
11 108 Twelve (/130, 9.2%) respondents indicated they strongly agreed their current outpatient service met  
12  
13 109 the needs of their local case-mix, 56 (/130, 43.1%) were in agreement, 21 (/130, 16.2%) neither agreed  
14  
15 110 or disagreed, 34 (/130, 26.2%) were in disagreement, and 7 (/130, 5.4%) in strong disagreement.  
16  
17 111 When asked whether existing service models (including funding, venue, staffing, resources) were  
18  
19 112 sustainable for the next 5 years, 9 (/130, 6.9%) reported they strongly agreed, 46 (/130, 35.4%) agreed,  
20  
21 113 32 (/130, 24.6%) neither agreed or disagreed, 36 (/130, 27.7%) disagreed, and 7 (/130, 5.4%) strongly  
22  
23 114 disagreed. Increased personnel (n=103/130, 79.2%), commissioned funding (n=89/130, 68.5%),  
24  
25 115 administrative support (n=74/130, 56.9%), and physical space for the service (n=56/130, 43.1%) were  
26  
27 116 factors required to support services.

28 117  
29 118 Additional factors reported to help sustain services over the next 5 years included better referral  
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31 119 pathways, clear standards to guide services, greater medical engagement, enhanced links with  
32  
33 120 primary care services, and improved profile of the service (all individually reported by one  
34  
35 121 respondent).

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137 **Table E1.** Features of outpatient recovery and follow-up services

Feature	Options	Frequency of occurrence (n/130, %)
Timeframe for first follow-up	2-3 months after hospital discharge	102 (78.5)
	6 months after hospital discharge	8 (6.2)
	1 month after hospital discharge	6 (4.6)
	Other <sup>a</sup>	13 (10.0)
Number and combination of professions of clinicians involved <sup>b</sup>	1 clinician	22 (16.9)
	- Nurse	- 18
	- ICU physician	- 3
	- Physiotherapist	- 1
	2 clinicians	41 (31.5)
	- Nurse, ICU physician	- 29
	- Nurse, Physiotherapist	- 9
	- ICU physician, Physiotherapist	- 2
	- ICU physician, OT	- 1
	3 clinicians	36 (27.7)
	- Nurse, ICU physician, Physiotherapist	- 19
	- Nurse, ICU physician, Psychologist	- 10
	- Nurse, ICU physician, OT	- 2
- ICU physician, Physiotherapist, Psychologist	- 2	
- Nurse, ICU physician, Psychiatrist	- 1	
- Nurse, Physiotherapist, SLT	- 1	
- Nurse, ICU physician, GRA	- 1	
4 clinicians	14 (10.8)	
- Nurse, ICU physician, Physiotherapist, Psychologist	- 7	
- Nurse, ICU physician, Physiotherapist, OT	- 3	
- Nurse, ICU physician, Physiotherapist, Dietitian	- 2	
- Nurse, Physiotherapist, Psychologist, Dietitian	- 1	
- Nurse, ICU physician, Physiotherapist, Psychiatrist	- 1	
5 clinicians	7 (5.4)	
- Nurse, ICU physician, Physiotherapist, Psychologist, Pharmacist	- 4	
- Nurse, ICU physician Physiotherapist, OT, SLT	- 1	
- Nurse, ICU physician, Physiotherapist, SLT, Dietitian	- 1	
- Nurse, ICU physician, Physiotherapist, OT, Psychologist	- 1	
6 clinicians	4 (3.1)	
- Nurse, ICU physician, Physiotherapist, OT, Psychologist, SLT	- 2	
- Nurse, ICU physician, Physiotherapist, Psychologist, Dietitian, Pharmacist	- 2	
7 clinicians	4 (3.1)	



	- Nurse, ICU physician Physiotherapist, OT, Psychologist, SLT, Dietitian,	- 1
	- Nurse, ICU physician Physiotherapist, Psychologist, SLT, Dietitian, Pharmacist	- 1
	- Nurse, ICU physician Physiotherapist, Psychologist, SLT, Dietitian, GP	- 1
	- Nurse, ICU physician, Physiotherapist, OT, Psychologist, SLT, Pharmacist	- 1
	8 clinicians	2 (1.5)
	- Nurse, ICU physician Physiotherapist, OT, Psychologist, Psychiatrist, Dietitian, Pharmacist	- 2
Location of service delivery	Dedicated hospital outpatient area	83 (63.8)
	Adapted space within critical care	26 (20.0)
	Other area within the hospital	11 (8.5)
	Community site	6 (4.6)
	Other <sup>c</sup>	3 (2.3)
Format of assessment by multiple clinicians <sup>d</sup>	Together (i.e. all clinicians in the same room)	77 (59.2)
	Separately (i.e. clinicians in different rooms)	42 (32.3)

Abbreviations: OT = Occupational Therapist; SLT = Speech and Language Therapist; GRA = Generic Rehabilitation Assistant; GP = General Practitioner

Legend: <sup>a</sup>Other includes: 2 weeks, n=3, 2-4 weeks, n=1, 6 weeks, n=2, 3 months, n=1, 3-6 months, n=4, 4-5 months, n=1, 6-12, n=1. <sup>b</sup>Administrative support counted separately; 29 (22.3%) sites reported administrative support for outpatient service.

<sup>c</sup>Other includes: Multiple areas for service deliver, n=2, Other clinical outpatient area, n=1 (n=1 blank response). <sup>d</sup>n=11 missing responses.

161 **Table E2.** Examples of outcome measures or tools to assess aspects of post critical illness recovery in  
 162 outpatient services

Impairment	Examples of outcome measures/tools
Anxiety	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Generalised Anxiety Disorder Assessment; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Short Form-36
Depression	Hospital Anxiety and Depression Scale; Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; EuroQol-5Dimension; Patient Health Questionnaire-9; Major ICD-10 Depression Inventory; Perceived Stress Questionnaire;
Post-traumatic stress disorder	Intensive Care Psychological Assessment Tool; Post-Traumatic Stress Symptoms-14 Instrument; Trauma Screening Questionnaire; EuroQol-5Dimension; Impact of Events Scale-Revised; Primary Care Post Traumatic Stress Disorder Screen;
Sleep quality	Insomnia Severity Index; Pain and Sleep Questionnaire
Sleep apnoea	STOP-Bang Questionnaire
Cognition	Montreal Cognitive Assessment; Mini-Mental State Examination; 4AT test; Confusion Assessment Method for the ICU; Addenbrooke's Cognitive Examination-Revised;
Health-related quality of life	Short Form-36; EuroQol-5Dimension; Schwartz Outcomes Scale-10
Personal activities of daily living	Barthel Index; Self-efficacy Tool; Short Form-36
Pain	Verbal/numeric 0-10 rating scale; Brief Pain Inventory; Critical Care Pain Observation Tool;
Breathlessness	Borg scale; Modified Medical Research Council scale; RAND breathlessness scale; pulmonary function tests; chest x-ray
Palliative care needs	RAND Mental Health Inventory
Sexual function	Sexual Health Questionnaire
Nutritional status	Weight
Physical function	Functional Independence Measure + Functional Assessment Measure; Rivermead Mobility Index; ICU Mobility Scale; Barthel Index; Chelsea Critical Care Physical Assessment Tool; Physical Function in ICU Test; Handgrip dynamometry; Six Minute Walk Test; Berg Balance Scale; Sit-to-Stand test; Short-Form 36; EuroQol-5Dimension
Exercise capacity	Six Minute Walk Test; Borg scale; EuroQol-5Dimension; Chelsea Critical Care Physical Assessment Tool; Tinetti test; Metabolic equivalents
Disability	Chelsea Critical Care Physical Assessment Tool; EuroQol-5Dimension

Frailty	Rockwood Clinical Frailty Scale; Clinical Frailty Scale; EuroQol-5Dimension
Dependency	EuroQol-5Dimension; Post-Traumatic Stress Symptoms-14 scale
Socioeconomic status	EuroQol-5Dimension
Pharmacological risk	-
Alcohol intake	Unit-based calculation
Smoking status	Pack year history
Driving status	Referral to a local driving centre; reference to DVLA (Driver and Vehicle Licensing Agency) guidelines
Flying status	Reference to British Thoracic Society (UK) guidelines
Additional comments	<i>A number of respondents reported no use of specific tools, but thorough clinical assessment +/- use of a 'concerns checklist', or 'distress thermometer', to identify and rate problems.</i>

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#### 187 **E4. Links between recovery and follow-up services and other services**

188 Forty-three respondents (/176, 24.4%) reported no links between their recovery and follow-up  
189 services and any neighbouring institutions, networks, or other referral pathways.

190

191 Remaining respondents (133/176, 75.6%) reported examples of links between their own services, and  
192 other similar services in neighbouring institutions, summarised into 8 categories: i) informal links into  
193 critical care networks including knowledge and best practice sharing (n=67/176, 38.1%), ii) linking to  
194 community service pathways e.g. pulmonary rehabilitation, psychology (n=27/176, 15.3%), iii)  
195 informal referrals made to neighbouring centres (n=20/176, 11.4%), iv) coordination with other  
196 specialty clinics e.g. respiratory, trauma, neurosciences (n=19/176, 10.8%), v) formal referrals made  
197 to neighbouring centres (n=10/176, 6.0%), vi) peer support referral (n=9/176, 5.1%), vii) formal  
198 referrals accepted from neighbouring centres (n=8/176, 4.5%), and viii) informal referrals accepted  
199 from neighbouring centres (n=6/176, 3.4%).

200

201 Examples given by respondents where links were present (87/176, 49.4%) between their  
202 recovery/follow-up services and primary care and/or community interfaces, were summarised into 8  
203 categories: i) referral to community therapy services (n=27/176, 15.3%), ii) patient letter sent routinely  
204 to primary care physician (n=26/176, 14.8%), iii) ad hoc contact with primary care physician (n=16/176,  
205 9.1%), iv) post critical illness information provided to primary care physician (n=15/176, 8.5%), v)  
206 signposting to community citizens advice and employment services support (n=11/176, 6.3%), vi)  
207 referral to community independent exercise programmes (n=9/176, 5.1%), vii) referral to community  
208 independent psychology services (n=8/176, 4.5%), viii) support for residential ventilation care  
209 (n=2/176, 1.1%). Eighty-nine respondents (/176, 50.6%) indicated that there were no links available  
210 with primary/community care sectors.

211

212 Around three-quarters of respondents indicated no links between their (adult) recovery/follow-up  
213 services and services managing paediatric, adolescent, or transition-to-adult (n=135, 76.7%), or with  
214 services for care of older adults (n=131/176, 74.4%). For the former, a small number of respondents  
215 (n=24/176, 13.6%) reported ad hoc links with paediatric services, and a minority (n=7/176, 4.0%)  
216 reported available links with transition-to-adult services. For the latter, a small number of  
217 respondents (n=23/176, 13.1%) indicated some ad hoc links with services during the inpatient stage  
218 of recovery, and a minority indicated links with community services (n=10/176, 5.7%) and older person  
219 psychiatric service (n=3/176, 1.7%).

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3 221 **E5. Peer support after critical illness**  
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5 222 Additional forms of peer support offered included: composite involving multiple options of delivery,  
6 223 visits from former patients, and a peer-mentor led group (all reported by one respondent each).  
7  
8 224 Furthermore, one respondent indicated their service was currently under active development, and  
9  
10 225 detail was not reported by one respondent.  
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12 226  
13 227 Three services were peer-facilitated only, and one other service involved former patients and families.  
14  
15 228 Other staffing was reported very infrequently (ranging 1-3 occasions); chaplaincy, critical care  
16  
17 229 outreach staff, counselling staff, advanced critical care practitioners, social work, pharmacy,  
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19 230 administrative staff, and ICU volunteers.  
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## 255 **E6. Post hospital discharge physical rehabilitation programmes**

256 Critical illness-specific post hospital discharge physical rehabilitation programmes were offered by 31  
257 (/176, 17.6%) hospitals. Physiotherapists led all but one programme, either alone (n=26/31, 83.9%),  
258 or in combination with a nurse, exercise/sports therapist, rehabilitation medicine specialist, or  
259 rehabilitation assistant (all n=1/31, 3.2%, each). One programme was led by an exercise/sports  
260 therapist. Clinicians leading programmes were either ICU-specialist (n=19/31, 61.3%) or  
261 rehabilitation-specialist (n=12/31, 38.7%). Physical rehabilitation programmes were primarily  
262 hospital-based (n=22/31, 71.0%), with some community-based (n=5/31, 16.1%), home-based (n=2/31,  
263 6.5%), and combination (home and community, n=2/31, 6.5%) delivery. Telehealth (or other  
264 interactive forms of intervention delivery) was used by only one respondent. Three-quarters of  
265 programmes were stand-alone (n=23/31, 74.2%), but a small number of respondents reported  
266 programmes were integrated with other disease-specific rehabilitation services n=5/31, 16.1%).  
267 Eighteen programmes (/31, 58.1%) were rolling programmes i.e. patients could enter the programme  
268 at any point, as opposed to part of a discrete cohort. Programmes were generally well serviced with  
269 no waiting list (n=23/31, 74.2%) and capacity to meet need (n=23/31, 74.2%). Further features of  
270 physical rehabilitation programmes are summarised in Table E3.

271  
272 All but one programme included an exercise component (n=30/31, 96.8%), albeit no further responses  
273 were provided by one respondent to detail their programme further. For the remaining respondents  
274 (n=29), features of the exercise component of their physical rehabilitation programme are reported  
275 in Table E4.

276  
277 Barriers to the delivery of post hospital discharge physical rehabilitation programmes are summarised  
278 in Table E5. These were reported by both respondents who did, and did not, offer a service. Lack of  
279 funding was both the most frequently reported barrier (n=128,176 72.7%) as well as the main barrier  
280 reported (n=86/176, 48.9%). Lack of sufficient staff was the second most frequent (n=116/176,  
281 65.9%), and main (n=28/176, 15.9%), barrier.

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289 **Table E3.** Features of physical rehabilitation programmes

Feature	Options	Occurrence (/31, (n, %))
Timepoint post hospital discharge that programme commences*	Immediately post hospital discharge	8 (25.8)
	2-3 months post hospital discharge	7 (22.6)
	Other – individualised per patient	5 (16.1)
	1 month post hospital discharge	3 (9.7)
	4-6 weeks post hospital discharge	2 (6.5)
	2 weeks post hospital discharge	2 (6.5)
Assessment criteria for patient inclusion~	Duration of ICU admission	22 (71.0)
	Duration of mechanical ventilation during ICU	17 (54.8)
	Physical function at ICU discharge	9 (29.0)
	Muscle strength at ICU discharge	9 (29.0)
	Exercise capacity at ICU discharge	9 (29.0)
	Physical function at hospital discharge	7 (22.6)
	Duration of hospital admission	5 (16.1)
	Muscle strength at hospital discharge	5 (16.1)
	Health-related quality of life at ICU discharge	4 (12.9)
	Exercise capacity at hospital discharge	4 (12.9)
	Health-related quality of life at hospital discharge	3 (9.7)
Session details <sup>a</sup>	Weekly	20 (64.5)
	Twice-weekly	3 (9.7)
	Individualised per patient	3 (9.7)
	Fortnightly	2 (6.5)
	<i>Number of sessions (median (IQR))</i>	6 (5.5-9.0)
Duration of sessions <sup>a</sup>	1 hour	15 (48.4)
	30 minutes	6 (19.4)
	Individualised	5 (16.1)
	45 minutes	2 (6.5)
Number of patients attending a session ( <i>open-ended question</i> )	Responses variable, ranging from individual patients (if a home-based programme or 1:1 format), to up to 20 in a group. Examples reported include 4-8, 6-8, average 6, up to 12, 8-10, 8-15	-
Staff: patient ratio ( <i>open-ended question</i> )	Responses variable; examples include 1:1, 1:3, 1:4, 1:5-6, 2:8, 2:6, 2:12; staff could be qualified or a combination of qualified and assistant	-
Education topics, and members of the MDT involved <sup>b</sup>	Yes	22 (71.0)
	No	6 (19.4)
	Exercise	18 (58.1)
	- PT, Nurse, Doctor*, PTA	17 (54.8)
	Recovery expectations	17 (54.8)

	<ul style="list-style-type: none"> <li>- PT, Nurse, MDT, Doctor*</li> </ul> Energy conservation	16 (51.6)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA, OT, Independent</li> </ul> Nutrition	13 (41.9)
	<ul style="list-style-type: none"> <li>- PT, DT, Nurse, Doctor*, MDT</li> </ul> Return to work	12 (38.7)
	<ul style="list-style-type: none"> <li>- PT, Doctor*, Nurse, OT, Vocational Specialist</li> </ul> Medications	11 (35.5)
	<ul style="list-style-type: none"> <li>- Doctor*, Nurse, PT, Pharmacist</li> </ul> Motivational training	11 (35.5)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, PTA</li> </ul> Stress management	9 (29.0)
	<ul style="list-style-type: none"> <li>- PT, Nurse, Psychology, OT, Doctor*</li> </ul> Other e.g. falls management, breathing control, mindfulness, individualised needs, goal-setting	5 (16.1)
Use of outcomes and examples of outcome measures <sup>c</sup>	Strength assessment	14 (45.2)
	<ul style="list-style-type: none"> <li>- Quadriceps strength, handgrip strength, repetition count, CPAX</li> </ul> Exercise capacity	17 (54.8)
	<ul style="list-style-type: none"> <li>- Walking tests (6MWT, ISWT), Timed Up and Go, CPEX</li> </ul> Health-related quality of life	18 (58.1)
	<ul style="list-style-type: none"> <li>- HADS, EQ-5D, SF-36</li> </ul> Cognitive/Mental health	2 (6.5)
	<ul style="list-style-type: none"> <li>- Readiness for return to work</li> </ul> Function	7 (22.6)
Onwards referral to other rehabilitation programmes <sup>d</sup>	Yes	20 (64.5)
	No	7 (22.6)
	Pulmonary rehabilitation	16 (51.6)
	Cardiac rehabilitation	15 (48.4)
	Community gym session	14 (45.2)
	Exercise on prescription (or similar community exercise/walking programme)	6 (19.4)

**Abbreviations:** ICU = intensive care unit; PT = physiotherapist; PTA = physiotherapy assistant; OT = occupational therapist; DT = dietitian; MDT = multidisciplinary team; CPAX = Chelsea Critical Care Physical Assessment Tool; 6MWT = Six Minute Walk Test; ISWT = Incremental Shuttle Walk Test; CPEX = cardiopulmonary exercise test; HADS = Hospital Anxiety and Depression Scale; EQ-5D = Euroqol-5 Dimension; SF-36 = Short-Form 36; NEADL = Nottingham Extended Activities of Daily Living; SPPB = Short Physical Performance Battery.

**Legend:** Respondents could choose more than one option from multiple response-option questions. \*Two respondents reported uncertainty on time-frame for programme commencement, one respondent reported it commenced after attendance at local follow-up programme, and one respondent did not report. ~Four respondents reported aspects of individual patient assessment by clinicians for appropriateness, and may be dependent on underlying diagnosis and/or ongoing rehabilitation requirements. One respondent reported inclusion was based on assessment after attendance at local follow-up programme. One respondent expanded on the use of the Chelsea Physical Assessment Tool and the Intensive Care Psychological Assessment Tool as assessment measures for applicable criteria. <sup>a</sup>Three non-responses. <sup>b</sup>Eleven non-responses. <sup>c</sup>Seven non-responses. <sup>d</sup>Four non-responses. \*Doctor = specialty not specified.



305 **Table E4.** Features of exercise components of physical rehabilitation programmes

Feature	Options	Occurrence (/29, (n, %))
Approach to patient exercise	Under supervision	15 (51.7)
	Independently	2 (6.9)
	Combination of aforementioned	11 (37.9)
	Dependent on individual patient	1 (3.4)
Design of exercise component	Patient-specific plan	17 (58.6)
	Pre-determined circuit	10 (34.5)
	Combination of aforementioned	2 (6.9)
Type of exercise included*	Strength	28 (96.6)
	Functional	26 (89.7)
	Cardiovascular	25 (86.2)
	Balance	23 (79.3)
Approach to exercise prescription~	Clinician judgement	23 (79.3)
	Results of physical function assessment	17 (58.6)
	Target level of exertion	13 (44.8)
	Results of walking tests	11 (37.9)
	Results of balance assessment	7 (24.1)
	Repetition maximum principle	4 (13.8)
Approach to exercise monitoring and progression#	Clinical observation of patient	20 (69.0)
	Patient verbal feedback	20 (69.0)
	Level of exertion	17 (58.6)
	Oxygen saturation level	10 (34.5)
	Reassessment of baseline measures	10 (34.5)
	Heart rate targets	9 (31.0)
	Visual analogue scale	2 (6.9)
	No formal monitoring	1 (3.4)
Accompanying rehabilitation or exercise manual	Yes	15 (51.7)
	No	14 (48.3)

306 *Abbreviations:* ICU = intensive care unit

307 *Legend:* \*Strength exercise e.g. lower limb, upper limb, free weights; Functional exercise e.g. sit-to-stand, walking;  
 308 Cardiovascular exercise e.g. step-up, treadmill, cycling; Balance exercise e.g. static, dynamic; 2 respondents reported also  
 309 including work-based movement pattern exercise. ~In addition to the response options, one respondent also indicated use  
 310 of a local graded exercise system incorporating 3 levels at each exercise station depending on individual patient ability. #3  
 311 respondents reported uncertainty as to detail of approach.

322 **Table E5.** Barriers to the delivery of post hospital discharge physical rehabilitation programmes  
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Barrier	Occurrence overall (n/176, %)	Occurrence as main barrier (n/176, %)
Lack of funding	128 (72.7)	86 (48.9)
Lack of sufficient staff	116 (65.9)	28 (15.9)
Resources prioritised to other patient groups/clinical areas	82 (46.6)	8 (4.5)
Not considered required service at managerial level	70 (39.8)	12 (6.8)
Lack of available space	70 (39.8)	4 (2.3)
Time constraints	49 (27.8)	5 (2.8)
Lack of trained staff	34 (19.3)	1 (0.6)
Not sure what content to include in a programme	30 (17.0)	0
No evidence to demonstrate rationale/requirement for service	25 (14.2)	3 (1.7)
Extracontractual (out of area) patient caseload	18 (10.2)	1 (0.6)
Insufficient patient numbers to justify	13 (7.4)	2 (1.1)
Other*	13 (7.4)	11 (6.3)

324 Missing responses, n=23 (overall), n=43 (main).

325 *Legend:* \*Other (overall) = Lack of patient motivation, n=3; no staff willing/motivated to run service, n=3; never considered  
 326 as a service previously, n=2; significantly large rural catchment area of hospital, n=1; lack of patient facilities e.g. transport,  
 327 parking, n=1; local referral pathways to physiotherapy services already in place, n=1; rehabilitation the responsibility of the  
 328 admitting clinical specialty, n=1; onset of the COVID-19 pandemic, n=1. Other (main) = no staff willing/motivated to run  
 329 service, n=3; non-commissioned service, n=1; no time to develop service, n=1; lack of patient motivation, n=1; onset of the  
 330 COVID-19 pandemic, n=1; patient moved from acute setting, n=1; patient heterogeneity limiting standardised service, n=1;  
 331 other rehabilitation service available to refer into, n=1; no single main barrier (all options apply), n=1.  
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347 **E7. Impact of COVID-19 on recovery and follow-up services following critical illness**

348 Summative content analysis{ ADDIN EN.CITE

349 <EndNote><Cite><Author>Hsieh</Author><Year>2005</Year><RecNum>47634</RecNum><Display

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354 </author></authors></contributors><titles><title>Three Approaches to Qualitative Content

355 Analysis</title><secondary-title>Qualitative Health Research</secondary-

356 title></titles><periodical><full-title>Qualitative Health Research</full-title><abbr-1>Qual. Health

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358 1288</pages><volume>15</volume><number>9</number><keywords><keyword>content

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360 care</keyword></keywords><dates><year>2005</year></dates><accession-

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363 urls></urls><electronic-resource-num>10.1177/1049732305276687</electronic-resource-

364 num></record></Cite></EndNote>} was used to review and identify themes from respondents' free

365 text responses detailing the impact of the COVID-19 pandemic on their services e.g. any changes to

366 existing services, if applicable, or the development of any new services. Table E6 presents the themes

367 generated, and the frequency with which they featured across all responses. Table E7 reports the

368 narrative free text responses with accompanying thematic coding.

369

370 **Table E6.** Themes describing changes to services as an impact of COVID-19 pandemic

Theme	Letter denoting theme	Frequency of occurrence (/162) (n, %)
No change to service	a	17 (10.5)
Applying for funds/new service as an impetus/response	b	44 (27.2)
Research about follow-up initiated	c	1 (0.6)
New service implemented: telephone based	d	14 (8.6)
New service implemented: face to face	e	16 (9.9)
New service implemented: virtual	f	12 (7.4)
New service implemented: exercise	g	15 (9.3)
Increased capacity/activity of existing service	h	40 (24.7)

Decreased capacity/activity of existing service	i	48 (29.6)
Increased frequency of existing service	j	20 (12.3)
Existing service conversion to telephone	k	30 (18.5)
Existing service conversion to virtual	l	44 (27.2)
Shortened review interval compared to previous	m	11 (6.8)
Addition of psychologist to service	n	6 (3.7)
Follow-up combined with respiratory medicine services	o	20 (12.3)

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For peer review only

**Table E7.** Narrative free text responses with accompanying thematic coding (with reference to Table E6)

Free text response*	Themes
We have performed telephone triage of all patients within a week of discharge and have then provided an MDT zoom clinic, each patient assessed for 30 mins with further follow up phone calls/ongoing referrals made (all patients have ongoing needs and will receive further follow up, our patient support group is virtual, we have started an exercise class and now have links to an exercise class run by the respiratory team for pulmonary fibrosis). We still have no psychologist though have funding for this service#	d, g, l, n, o
Business case being rewritten	b
Our Follow Up team had been pulled to work clinically on ITU during Covid 19. Currently one member now back to doing follow up. Limited in hospital follow up has occurred due to infection risk in different ward locations. Outpatient clinic follow up being done virtually using video technology#	i, l
More frequent follow up clinics, more exercises based reviews for discharge. We would love some psychology input	g, h, j, n
Currently the rehab role is 18.5hrs for the clinical nurse specialist, this is being increased 37.5 for 8 weeks due to increased patient numbers. No other services hours have been increased	h
Currently have an intensivist running clinic and doing more patient assessments and tests. Running 5 physio rehab classes a week on line with support group. Post ICU ward visits taking much longer. Telephone consultations have increased	g, h, j
Follow-up service is now online	l
Awaiting response to business case for dedicated follow up funding	b
Services have been delayed as needed to work clinically. We are looking at trying to get funding to provide rehab sessions post discharge.	b, i
No outpatients since start of covid, now setting up video conference for non covid patients and outpatient appointments for covid patients with further physical examination and other clinician input.	i, l
Plans for physical rehabilitation programme whilst inpatient and following discharge, trying to obtain psychology input, formal payment from commissioners for follow up clinic	b, g, n
With COVID there is a much greater demand for all of these services. We are including all COVID level 2 and 3 patients on our post ICU pathway (including those having CPAP in non ICU areas), and ICU follow up clinic, we are only in the early stages of working out how we are going to deal with the increased work load. The patients are all receiving an earlier psychol review and cognitive assessment as an inpatient, and once at home an initial in depth 1:1 virtual rehab assessment with them and then will be invited to a virtual exercise class (increased to twice weekly from the usual once weekly) , with a link to access exercise videos in their own time. We have separated off the psychological and physical aspects of clinic - the former is done first, then the latter. There will need to be more sessions for ICU clinic. We are also linking in with the respiratory consultants, so as not to be duplicating workload as a result of their COVID BTS guidelines. This will all require increased resources, we are unsure where this will come from currently	b, g, h, l, m, o
Our therapists have visited each of our Covid admissions at home as part of a research study that we have devised and gained approval for. We also held a follow up Covid clinic with a respiratory physician, a physio and an OT.	c, e, o
Telephone contact not face to face	d
Use of online platforms for follow up, communication with relatives and discharged patients	l
Telephone follow up to discharged patients	k
Just setting up a multidisciplinary follow up clinic for covid patients and trying to expand that to all patients but not commissioned yet... Using modified pickups tool for screening	b
Covid-19 essentially stalled all non-pandemic business and delayed implementation. The loss of SPA time negatively impacted planning.	b, i

1	During COVID 19 the clinic was point on hold. Due to lockdown and the senior sister required to	i, l
2	work clinically. Since the lockdown the clinic has now been undertaken via telephone	
3	consultation. We have increased the service to two nurses to help "catch up"	
4		
5	This will have to be a "telephonic" clinic and I am not sure how effective it will be. The numbers	b, i, k
6	will be overwhelming and I am not sure as we have not yet commenced clinics at our hospital.	
7		
8	Face to face follow up clinic now telephone based Delay in getting x2 Rehabilitation therapy	i, l
9	assistant practitioners interviewed in March 2020 into post, Delay in being able to set up post	
10	ICU Support groups	
11	Have submitted business case for proper follow up service	b
12	Increased clinic as we have a white worker calling patients from home	h, k
13	Step down rehabilitation ward created and patients received a lot of input from allied health	h, j, m
14	professionals to reduce length of stay. Increased hours for Follow Up clinic	
15	Physio involvement. Difficulty delivering Follow-up clinics	h, i
16	Not received OT funding. Availability of working at home. Clinic & rehab class now online.	b, g, i, l
17	Increased info available online. Timing delayed as Follow up role during pandemic paused as	
18	helping on unit.	
19		
20	Usually 3 critical care follow-up nurses and 0.3 physiotherapist in follow-up (physiotherapy only	e, h
21	reviewed ward based patients needing assistance of 2 or more to transfer) - nil involvement in	
22	outpatient follow-up. During COVID physiotherapy now 1.0 equivalent - partaking in	
23	telecommunications with patients and MDT follow-up clinic. MDT follow up clinic due to be	
24	trialled this week (Consultant, nurse, physiotherapy, OT, SLT, dietician)	
25	New joint clinic with respiratory team for COVID ICU pts	e, h, o
26	Permanent loss of gym. Restrictions on group exercise. Limited staffing. Limited suitable	i
27	patients	
28	No	a
29	Impetus to develop follow-up services for critical care	b
30	We have established a 6 week MDT to discuss patients after phone contact. Full MDT attendance	d, h
31	(physio, nurses, OT, psychology, dietitian, SLT, medic). All good will with no funding	
32	Implemented Nurse led follow up for all COVID-19 patients and general critical care patients	d, f, h
33	who have been on critical care for 4 days or longer	
34	Phone triage for follow up clinic	k
35	Outpatient clinics have been done via telephone rather than face to face. We haven't yet been	b, k
36	able to secure support to run the clinic via a virtual medium - although we are hoping to run	
37	clinics this way soon	
38		
39	We have set up a COVID follow up service alongside the respiratory physicians. This involves a	b, d, e, h,
40	phone clinic to all patients admitted to hospital with COVID and those with ongoing resp needs	m, o
41	only are then seen face to face by resp alone, those with multimorbidity and post ITU issues are	
42	seen in an MDT. The MDT comprises of Critical care physician, respiratory physician, critical care	
43	physio, critical care OT, SLT, Specialist nurses for critical care and psychology. The clinic runs	
44	fortnightly and we see 6 patients face to face. The patients have lung function done on arrival.	
45	They are in clinic for 2.5-3 hours. The aim is a one stop assessment and they are referred onto	
46	other services such as musculoskeletal physio, dysfunctional breathing clinic, outpatient	
47	cognitive rehab etc. This is funded in part by emergency funds at the moment and a significant	
48	amount of goodwill. It will stop once the COVID patients are seen but we are hoping to use the	
49	information gained from this to set up a fully fledged critical care follow up service <sup>#</sup>	
50	All clinic activity halted other than phone calls	d, i
51	Our class is now running virtually with weekly phone calls, booklets and exercises sent to	g, k, l
52	patient, videos emailed of exercise. Follow up is now just telephone but looking to being able	
53	to meet patients face to face again	
54	No	a
55	Due to COVID for first few weeks the service was suspended. But then started via phone call.	i, k, l
56	Currently Follow up clinic is up and running virtually.	
57	Inpatient round initially paused, restarted a few months ago. Follow up clinics now virtual, either	i, k, l
58	via video or telephone. Timescale to follow up potentially longer due to back log.	
59	Telephone follow up. Email	k

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	<p>Current loss of outpatient service and exercise programme. Unable to allow patients to visit critical care post-discharge. Using teleconference for ICU Steps meetings. Using more telephone consultations.</p> <p>Separate fully funded MDT follow up clinic for Covid including those through ICU. Continue with inpatient ward round reviews, now also supported by a Physio. Clinic review now in virtual format, phone or attend anywhere</p> <p>The staff load was much higher, so the Rehabilitation After Critical Illness pathway was sometimes not followed up. We had to move to phone calls only review.</p> <p>Rehabilitation After Critical Illness consultant and Coordinator had meeting with Mental Health consultant but decided to continue link already established as numbers very small</p> <p>No follow-up clinics</p> <p>Business case approved so now working on developing service for the Trust</p> <p>No new services</p> <p>Covid have stopped all our services, but i have restarted ward based follow up visits</p> <p>We are running the same service but at the moment the follow up clinic is being run via video link</p> <p>Support group currently suspended - telephone calls made ad hoc to patients needing support. Priority given to acute patients on outreach service - however post discharge to ward patients still reviewed#</p> <p>Outpatient clinic cancelled for three months - now via telephone, video Increased managerial interest in post covid problems</p> <p>This has made the management think this may be important. This has led to some management cooperation with setting up a future service and a post covid service now. However we have to fund from within our dept. This may change. Clinical director now working with the ICU medical director to develop local covid rehab. It is still being shaped as a service by people with no expertise in the topic. A box will be ticked but it won't be great.</p> <p>None so far</p> <p>Service under development anyway. Has highlighted need for service to senior management</p> <p>Some consultant and nursing staff went to local acute trust to help out for 3 months</p> <p>Plan on having virtual clinics Aim to see bereaved relatives who did not get the chance to visit</p> <p>Will be referred to pulmonary rehab service. Increase in staff in that service. Will not be COVID specific</p> <p>No more resources or funding but many more patients and relatives</p> <p>Virtual follow-up clinic now running Increased frequency to weekly rather than bi-weekly (for 3 month period) to meet patient demand Virtual or telephone physiotherapy rehabilitation Developing electronic notes for all MDT#</p> <p>As staff were redeployed then an 2-3x weekly inpatient review was provided on the wards for all ICU survivors, but physio, physio assistant (and ICU nurse at one site). A post-COVID rehabilitation group has been set up at (second site) for ICU Survivors once home, with aim to roll out across the trust imminently, Increased clinic capacity provided for time limited period to be able to offer ICU Follow Up clinic to all ICU COVID Survivors#</p> <p>Adapted to remote delivery - now weekly 1 hour group - 30 mins physio + Q+A + 'guest speakers' + mindfulness#</p> <p>Dedicated therapy team to ICU during pandemic with a view to make this permanent. Combined COVID clinics with respiratory team/consultant. Further highlighting need for OT. Respiratory consultant has attended Group support meetings are now via zoom</p> <p>Trialing of telephone follow up - very time consuming; unable to follow through patients with current staffing levels#</p> <p>Reduced in hospital follow up due to staffing pressures.</p> <p>All services paused during the peak of the pandemic. Since then the service has doubled each month to see the increased number of discharges that require rehab follow up</p> <p>We have secured funding for a post Covid 19 follow up clinic. This resource can only deliver services to a small number of patients. Patients initially receive a phone-call screening. If required they can be seen in a follow up clinic (either remotely or face-to-face). This clinic is run by Medics, Nursing, Physio, OT and Psychology (one of each).</p>	<p>i, l</p> <p>b, l</p> <p>i, k</p> <p>a</p> <p>a</p> <p>b</p> <p>a</p> <p>i</p> <p>l</p> <p>d, i</p> <p>i, k, l</p> <p>b</p> <p>a</p> <p>b</p> <p>i</p> <p>i, l</p> <p>i</p> <p>i</p> <p>h, j, m</p> <p>g, h, j, m</p> <p>l</p> <p>b, f, h, o</p> <p>i, k</p> <p>i</p> <p>h, j</p> <p>b, e, f</p>
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Trialling a clinic model for covid patients	b, h
Virtual pathway set up on discharge - 12/52 pulmonary rehab pathway run by gym techs	f, g, h
No face to face reviews difficulty progressing with launch of rehab service instead of existing follow up clinic	b, h
Have developed a follow-up service specifically for COVID patients	e
We delayed the follow up clinic during the pandemic period and we are not having to reinstate it. - ITU consultants are also seeing all the covid patients as we expect to see a lot of PTSD.	i
Difficult question to answer as our hospital was shut due to COVID outbreak. All admissions were diverted to surrounding hospitals. At time of writing we are only just starting to reopen	A
Fewer available healthcare professionals due to sickness or shielding	i
Now telephone clinic	k
Limited peer support	i
All assessments and follow up appointments have been done via either telephone or video call. No face to face appointments within the physio clinic as yet. Consultant follow up at 3/12 is now face to face as an option. Rehab group not currently running with lots of barriers to work round before it can run again. Patients are sent home exercise programme to complete with support and guidance remotely. Hoping to try a virtual class if ongoing delay to physical class being restarted. A positive has been greater joint working with Dieticians and due to the increased numbers, as the Physio now undertake the initial nutrition screen if they aren't routinely following up. will then refer to them if needed. Definitely greater MDT working with them.	g, k, l
We had MDT staff all working together	h
Sadly follow up was temporary halted due to clinical need, now back up and running. Sudden interest in COVID patients and their rehab needs but it is all ICU patients that need it.	i
Video and teleconferencing to patients	f
2 weeks post-discharge telephone follow up in addition to the usual 2-3 months post discharge follow up clinic, virtual clinics (so far telephone only)	d, j
Improved follow-up from ICU Therapists from ICU to ward. Improved connections with specialist rehab services. Unable to offer gym 1:1 follow-up rehab.	b, h
Face to face clinics now on a virtual platform; peer support meeting to go on Zoom virtual platform. Forced reduction of follow up service for non-covid patients. In-patient rehab support and information for covid patients but now discontinued due to staff returning to clinical areas. Support from the Rehabilitation clinical team for non-ventilated ICU covid patients i.e. had NIV only	i, l
Not critical care linked but follow up outpatient appointments for COVID patients within the respiratory department, linked with a clinical psychologist. Cards sent to critical care patients post COVID offering them to get in touch/ meet with members of staff to discuss their ICU stay	e, n, o
Daily physio input to covid patients as part of outreach team as 6 week pilot. Referral pathway to clinical psychologist via outreach Letter to patient's home explaining ICU journey Extended outreach on the ward including family support Telephone screening of problems prior to follow up clinic Transition from face-to-face to telephone clinic <sup>#</sup>	d, h, k
Our service has been put on hold temporarily due to staffing constraints	i
Critical care rehab team changed referral criteria to pick up all patients from ICU with Covid-19. Covid-19 rehab guide produced for inpatient and to continue once discharged. Covid-19 MDT in community is being developed. Follow Up clinic has stopped due to lockdown and acute caseload. Not yet restarted but patients highlighted are being called by Intensivist.	i, k
Increased number of clinics and expansion of personnel	h, j
MDT approach and referrals pathway	h
Increased ITU beds, Increased number of clinics More professionals involved. Video consultation intensive care follow up clinics <sup>#</sup>	h, j, l
A new Covid19 follow up clinic has been set up combined with respiratory team.	b, e, o
Psychology support for patients and relatives	b, h
Routine video clinic for most patients (with option of face-to-face review if required). Sooner first review (4 weeks rather than 8-12 weeks)	l, m
Initially clinic paused therefore generated waiting list. Criteria remains > 3 days on critical care. Have introduced telephoning screening system, inclusive of locally designed symptom screening questions, PHQ2, GAD2, and trauma screening questionnaire to identify patients who need MDT	i, k, l



review in follow-up clinic. If patients score > 3 on screen, > 3 on PHQ2 or GAD2, or >6 on TSQ they are invited to clinic. This screening is completed by a nurse, occupational therapist or physiotherapist. Patients who have ongoing symptoms are invited to clinic, they can attend via teleconference, face-to-face or virtually via attend anywhere. Our clinic team now includes an occupational therapist, based on temporarily agreed funding.	
Remote clinic	l
Expansion by 46 beds Recruitment of 15 consultants, 30 trainees, and ~200 nurses#	a
COVID follow up. Video conferencing clinic appointments, patients can no longer be taken back to the ITU - setting up virtual reality tours. No diaries kept during COVID - looking into virtual diaries. More interest in MDT follow up.	h, l
Considering doing outpatient follow up clinic virtually - allocated team reaching into ICU and following patients up on ward -physio led virtual clinics for all critical care patients - all post covid patients discharged from hospital, will be seen in a virtual physio led clinic	b, f
Additional clinics and more physiotherapy services	h, j
Review of services - COVID evidence/guidance as instigated review of critical care unit follow up services	b
There are plans for a follow up service	b
Increased from x2/month to x2/week. Face to face to video/telephone consultation with Respiratory physicians doing face to face clinic with investigations of heart and lungs in hospital. We focused on holistic, cognitive and psychosocial aspects. Funded via Covid block payment#	h, j, l, o
All initial assessments done over telephone, but greater input earlier in discharge process. MDT input from respiratory team	j, k, o
Increased use of phone and video call follow up	k, l
Follow up service currently on hold, although many patients have been written to and sent an ICU Steps booklet. These patients will be followed up virtually In due course. New build planned with expanded number of beds, and then re-purposing of existing beds for respiratory beds and level 1.5 beds	i, l
Nil	a
Delayed as still significant covid demand. All clinics have been cancelled & telephone clinics have been set up but hindered by lack of resources & information	j, k
Face to face clinics suspended. Support groups suspended. Home visits carried out as per government guidelines maintaining social distance at all times	i
Not aware	a
The patient support group has not been running due to social distancing and members of the public not being able to attend the hospital. The Critical care Outreach team implementation has been delayed. (it is a new service)	b, i
We have had funding for 2 rehab techs to follow pts from ITU to the ward and then home to give physical support. This funding was secured prior to Covid but has the staff have started this month so in line with Covid.	b, e
We have seen our COVID patients at 2-3 weeks post discharge instead of 2-3 months and have instigated a rehab course for them in conjunction with pulmonary rehab team#	j, l, m, o
We started the first follow up clinic last week virtually. We plan on continuing with the virtual clinics#	l
We have gone to virtual clinics. The numbers are high. It pushed the follow up agenda. During the COVID-19 response the unit now has 2 clinics that it contributes to, developed from a need to provide critical care input alongside respiratory for follow-up of all ventilated COVID-19 patients as part of the British Thoracic Society's follow-up recommendations. One clinic is led by one consultant (dual Intensive Care Medicine/Respiratory) that follows up all patients at 12 weeks (or thereabouts) in terms of physical/cognitive/psychological symptoms, and co-ordinating any on-going need for investigation/management. This clinic runs on one or two afternoons a week dependent on clinical availability of that consultant, and only started in July. It is a face to face clinic, and several screening questionnaires are used as part of the appointment. The other clinic that has been created out of the COVID-19 response is a virtual multi-disciplinary clinic (hosted on Attend Anywhere) involving consultant intensivist, psychologist and physiotherapist. They each have a half hour slot with the patient for their assessment. It runs once a week, and three consultants contribute to it. It includes all health	a, b, e, f, h, l, o

board patients that have been ventilated on the unit for 72 hours or longer. It was initially established in July as well, as a way of attempting to deliver the 6 week virtual COVID follow-up as per the BTS recommendations, but also follows up non-COVID patients <sup>#</sup>	
Psychology now directly involved (previously ICU consultant would screen and refer as needed which incurred some delay) and attend each clinic visit along with the ICU consultant Clinics suspended for 3 months due to Covid activity and escalated rotas. Unable/unwise to bring patients to hospital during lockdown so virtual clinic format set up. Due to service reconfiguration, the area formerly used for ICU clinic is unavailable, so virtual clinic will continue for the foreseeable future. Virtual format works reasonably well but it limits our ability to bring patients into the physical space of the ICU environment which many patients found very useful. We have replaced this with sharing pictures and videos over Zoom which is good but not ideal. We have found in the virtual format we have less contact with family members. In a face-to-face clinic a family member would usually attend with them and we were able to give them some support and debrief too. Patients seem less likely to involve family members on video call for some reason	b, i, l, n
New pilot service established for COVID patients - combination of virtual and face to face. Intensivist/physio/psychology team and hope to get an exercise program delivered virtually <sup>#</sup>	b, e, f, g
n/a	a
Face to face abandoned during Covid surge. Now reinstated but backlog of cases so some telephone triage occurring. Patients currently attending later after discharge than previously	i, k
We will need to do virtual clinics and lose the peer support but we will aim to bring back face to face clinics asap	i, l
Along with another hospital in the health board, we have applied for funding for a post covid follow up clinic	b
n/a	a
Nil	a
Timing, use of virtual clinic, videoconferencing. Work starting for respiratory follow up for all COVID patients admitted to level 2 or level 3 May have a one stop clinic involving many specialties specifically for COVID patients which is (organisation) wide. Still all in pipeline. Otherwise clinics will be virtual rather than meeting with limited peer support	b, l, o
No changes at present	a
Unable to offer class format so at planning level re moving forward. Phone call check-ins are commencing. Virtual appointments have been discussed but concerns re; funding and staff availability. Time consuming processes so trying to factor that in.	i, k
Cancellation of face to face reviews/ exercise classes. Move to telephone assessments in first phase. Then videoconferencing if deemed useful. Likely to result in significant reduction in what can be offered.	i, k
Testing delivery virtually via telephone and Near Me	k, l
Programme now virtual/online	l
Formal follow-up not been continued- currently on hold. Support given to bereaved families with psychology support. Letters/phone call follow up	i
No new staffing but more formalised ICU follow-up service and screening being planned with relevance to what we already do and what we could do more in a joined up fashion. All covid positive pneumonia patients have been triages and follow-up as deemed necessary within existing pulmonary rehab services.	b, h, o
During COVID the Critical Care Outreach Team were redeployed to other posts and the service was disbanded temporarily.	i
New Post ICU follow up service now partially funded	b, e, f
We have just received funding to set service up	b
1. New bi-weekly MDT initially for COVID patients but thus far has extended, at least for now, to include non-COVID patients. 2. "Tailored Talks" as discussed earlier. Novel personalised information provision support service. 3. Chest, Heart and Stroke nursing support through telephone follow up post hospital discharge, as previously mentioned	d, h, j, o
Nil	a

Unable to deliver current group model. We have started to try and deliver a virtual programme to individuals using near me consultations and assessments. We are also considering delivering presentations remotely via videoconferencing links.	i, l
Massive impact on ability to deliver ward based follow up. Patients no longer attending hospital for follow up clinic. Now exploring the use of technology for virtual follow up clinic. Using a lot more telephone consultations. However, this has given us an opportunity to rethink how we do things and as a consequence we are developing a more joined up service using the MDT.	b, k, l
There has been no changes to our service. In fact this service was cut for the first 4 weeks of the pandemic to allow staff to be pulled to deliver direct patient care.	i
We had disruption of our service due to Covid	i
Hospital wide Post-COVID discharge follow up service. We are also developing a post Critical Care follow up service for post-COVID patients.	b, h

\*Responses reported verbatim with the exception of edits made to ensure no identifiable detail. #Indicates a response that applied to more than one individual hospital within an overarching healthcare organisation.

Abbreviations: MDT = multidisciplinary team; ICU/ITU = intensive care/therapy unit; OT = occupational therapy; SLT = speech and language therapy.

## References

{ ADDIN EN.REFLIST }

**CHERRIES Checklist****Enhanced provision of critical illness recovery and follow-up services: a national survey and progress report**

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Item category	Checklist item	Page number	
Design	Describe survey design	7	
IRB (Institutional Review Board) approval and informed consent process	IRB approval	8	
	Informed consent	9	
	Data protection	9	
Development and pre-testing	Development and testing	7	
Recruitment process and description of the sample having access to the questionnaire	Open survey versus closed survey	8	
	Contact mode	8	
	Advertising the survey	8	
	Survey administration	Web/E-mail	8
	Context	N/A	
	Mandatory/voluntary	N/A	
	Incentives	N/A	
	Time/Date	8	
	Randomisation of items of questionnaires	7	
	Adaptive questioning	7	
	Number of items	Online Supplement	
	Number of screens (pages)	Online Supplement	
	Completeness check	8	
	Review step	Online Supplement	
Response rates	Unique site visitor	N/A	

	View rate (Ratio of unique survey visitors/unique site visitors)	N/A
	Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	9
	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	9
Preventing multiple entries from the same individual	Cookies used	N/A
	IP check	N/A
	Log file analysis	N/A
	Registration	7
Analysis	Handling of incomplete questionnaires	8-9
	Questionnaires submitted with an atypical timestamp	N/A
	Statistical correction	8-9