Provision Of Psychological support to People in Intensive care

# Psychological Outcomes following a nurse-led Preventative Psychological Intervention for critically ill patients (POPPI) trial

| | |
|---|---|
| NHS REC Committee no: | **15/SC/0287** |
| IRAS no: | **173772** |
| Trial Sponsor: | **ICNARC** |
| Trial Sponsor reference: | **01/03/14** |
| Trial funder(s): | **NIHR HS&DR Programme** |
| Funder(s) reference: | **12/64/124** |
| ISRCTN Registry no: | **ISRCTN53448131** |
| NIHR CRN Portfolio no: | **18940** |
| Protocol version: | **2.1** |
| Protocol version date: | **2 January 2017** |

| **Role:** | **Name and Position:** | **Date:** |
|---|---|---|
| Chief Investigator: | Professor Kathryn Rowan<br>Director of Scientific & Strategic Development/CTU Director, ICNARC | 2 January 2017 |
| For the Sponsor: | Kevin Hunt<br>Chief Executive, ICNARC | 2 January 2017 |

**Trial Management**

For general enquiries, please contact:

Mr Paul Mouncey, Senior Trial Manager

Clinical Trials Unit

Intensive Care National Audit & Research Centre (ICNARC)

Napier House

24 High Holborn

London WC1V 6AZ

Tel: +44 (0)20 7269 9277

Fax: +44 (0)20 7831 6879

Email: poppi@icnarc.org

**Trial Team**

| | |
|---|---|
| *Chief Investigator* | |
| Prof Kathryn Rowan | Director of Scientific & Strategic Development/CTU Director, ICNARC |
| *Lead Clinical Investigator* | |
| Dr Dorothy Wade | Chartered Health Psychologist, University College London Hospitals NHS Foundation Trust (UCLH) |
| *Public/Patient* | |
| Mr David Aaronovitch | News UK |
| *Clinical* | |
| Prof Chris Brewin | Professor of Clinical Psychology, University College London (UCL) |
| Dr David Howell | Divisional Clinical Director, Critical Care, UCLH |
| Prof Michael Mythen | Professor of Anaesthesia & Critical Care, UCLH/UCL |
| Miss Deborah Smyth | Senior Nurse, Critical Care, UCLH |
| Prof John Weinman | Professor of Psychology, King's College London |
| Mr John Welch | Consultant Nurse, UCLH |
| *Methodological* | |
| Prof Richard Grieve | Professor of Health Economics, London School of Hygiene & Tropical Medicine (LSHTM) |
| Dr David Harrison | Senior Statistician, ICNARC |
| Dr Sheila Harvey | Lecturer, Global Health and Development, LSHTM |
| Dr Zia Sadique | Lecturer in Health Economics, LSHTM |

## Sponsor

ICNARC

Napier House

24 High Holborn

London  WC1V 6AZ

Sponsor contact:

Mr Kevin Hunt, Chief Executive

Tel: +44 (0)20 7831 6878

Fax: +44 (0)20 7831 6879

Email: kevin.hunt@icnarc.org

## Funding

National Institute for Health Research (NIHR) – Health Services & Delivery Research Programme (HS&DR) (Project: 12/64/124)

# Contents

## Abbreviations

| | |
|---|---|
| CAM-ICU | Confusion Assessment Method for the Intensive Care Unit |
| CBT | Cognitive Behavioural Therapy |
| CBTp | Cognitive Behavioural Therapy for psychosis |
| CEA | Cost-effectiveness Analysis |
| CI | Confidence interval |
| CMP | Case Mix Programme |
| CRF | Case Report Form |
| CTSA | Clinical Trial Site Agreement |
| CTU | Clinical Trials Unit |
| DMEC | Data Monitoring and Ethics Committee |
| DSM-IV | Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition |
| eCRF | Electronic Case Report Form |
| EQ-5D | European Quality of Life Scale |
| GCP | Good Clinical Practice |
| GLMM | Generalised linear mixed model |
| GP | General Practitioner |
| HA | Health Anxiety |
| HADS | Hospital Anxiety and Depression Scale |
| HRQoL | Health Related Quality of Life |
| HS&DR | Health Services & Delivery Research |
| ICH | International Conference on Harmonisation |
| ICNARC | Intensive Care National Audit & Research Centre |
| ICU | Intensive Care Unit |
| IPAT | Intensive care Psychological Assessment Tool |
| ISF | Investigator Site File |
| LSHTM | London School of Hygiene & Tropical Medicine |
| MRC | Medical Research Council |
| NHS | National Health Service |
| NICE | National Institute for Health and Care Excellence |
| NIHR | National Institute for Health Research |
| PI | Principal Investigator |
| PIAG | Patient Information Advisory Group |
| POPPI | Psychological Outcomes following a nurse-led Preventative Psychological Intervention for critically ill patients |
| PSS-SR | PTSD Symptom Scale – Self-Report version |
| PTSD | Post-traumatic Stress Disorder |
| QALY | Quality-adjusted life year |
| R&D | Research & Development |
| RASS | Richmond Agitation Sedation Scale |
| RCT | Randomised Controlled Trial |
| REC | Research Ethics Committee |
| SOP | Standard Operating Procedure |

| | |
|---|---|
| SSS | Stress Support Session |
| STAI | State Trait Anxiety Inventory |
| TMG | Trial Management Group |
| TSC | Trial Steering Committee |
| UCLH | University College London Hospitals NHS Foundation Trust |

# Protocol summary

## 1.1 Summary of trial design

| | |
|---|---|
| **Title (acronym):** | Psychological Outcomes following a nurse-led Preventative Psychological Intervention for critically ill patients (POPPI) |
| **Public Title** | Provision Of Psychological support to People in Intensive care |
| **Short Title:** | POPPI |
| **Sponsor name:** | Intensive Care National Audit & Research Centre (ICNARC) |
| **Funder name & reference:** | NIHR Health Services & Delivery Research Programme, 12/64/124 |
| **Design:** | Cluster-randomised controlled trial (cluster-RCT) |
| **Aim:** | To evaluate the clinical and cost-effectiveness of a complex nurse-led preventative psychological intervention in reducing patient-reported post-traumatic stress disorder (PTSD) symptom severity, and other reported psychological morbidities, at six months versus usual care. |
| **Primary outcomes:** | To evaluate:<br>• Patient-reported PTSD symptom severity at six months<br>• Incremental costs, quality adjusted life years and net monetary benefit |
| **Secondary outcomes:** | To compare:<br>• Days alive and free from sedation to day 30<br>• Duration of critical care unit stay<br>• Depression at six months<br>• Anxiety at six months<br>• Post traumatic Diagnostic Scale score of greater than 18 points at six months<br>• Health-related quality of life at six months |
| **Anticipated accrual:** | 1,378 critical care patients |
| **Inclusion criteria:** | • Age 18 years or greater<br>• Greater than 48 hours in critical care unit<br>• Receipt of some Level 3 critical care during first 48 hours<br>• Between +1 and -1 on the Richmond Agitation Sedation Scale<br>• Glasgow Coma Score of 15<br>• English-speaking<br>• Ability to communicate orally |
| **Exclusion criteria:** | • Pre-existing chronic cognitive impairment, such as dementia<br>• Pre-existing psychotic illness, such as schizophrenia<br>• Pre-existing chronic post-traumatic stress disorder<br>• Receiving end-of-life care<br>• Previously recruited to POPPI |
| **Planned number of units:** | Twenty-four NHS adult, general critical care units |
| **Anticipated duration of recruitment:** | Seventeen months |
| **Duration of follow-up:** | Six months |
| **Definition of end of Trial:** | Last patient, last follow-up |

# 2 Introduction

## 2.1 Background & rationale

Over 100,000 patients are admitted to adult, general critical care units in the National Health Service (NHS) each year and it has been estimated that around two thirds suffer serious emotional distress, and/or unusual experiences such as hallucinations and delusions, while in the unit.[1, 2] Emotional distress, including severe symptoms of anxiety, low mood and panic, may be caused by a range of stressful, cumulative experiences that are common in the critical care unit: fear of dying; invasive treatments such as mechanical ventilation; pain and discomfort; inability to communicate; and terrifying hallucinatory delusions.[1, 3-5] The aetiology of the characteristic hallucinations and delusions of critical care unit patients is unknown, but they have been linked to delirium, the provision and withdrawal of sedative and other psychoactive drugs, effects of illness (such as sepsis), immobility, and sensory and sleep deprivation.[2, 4, 6] Hallucinations and delusions are known, from the psychosis literature, to be exacerbated by, and co-morbid with, emotional stress. Critical care unit hallucinations frequently have horrifying themes such as conspiracy to kill by staff, torture, poisoning, demons, extortion or organ theft[7]; thus a vicious cycle of stress, confusion, and terror is common for critical care unit patients.

Experiencing acute psychological stress in the critical care unit, or having frequent memories of hallucinations and delusions, are also among the identified risk factors for longer-term post-critical care posttraumatic stress disorder (PTSD), depression, anxiety or cognitive impairment.[4, 8-12] Recently published systematic reviews of survivors of critical care identified rates of PTSD up to 27%, months or years after leaving critical care, and a mean PTSD prevalence of 20%.[3, 13] High rates of depression following critical care have also been reported, with a median prevalence of 28%.[14] A study that followed patients up to two years, found 40% with depression[15]. Patients who develop serious psychological morbidities are at much higher risk of further physical morbidities and mortality[16-18] representing a serious burden to patients, to their carers and to the NHS.[19, 20]

It is more than 15 years since the Department of Health explicitly recognised this serious problem, stating in the year 2000 that the critical care unit was extremely distressing for patients and that there was considerable need for psychological support for traumatised patients.[21] In 2009, the National Institute for Health and Care Excellence (NICE) recommended that all critically ill patients should be assessed for risk of non-physical morbidity, and that those at high risk of adverse outcomes such as PTSD, should receive structured psychological support, both during and after their unit stay.[22] NICE guidance on the diagnosis, prevention and management of delirium recommends that patients identified as being at high risk of delirium (including all critically ill patients), should be monitored closely, and strategies for intervention implemented as soon as possible.[23] Even more recently, in 2012, NICE has highlighted the importance of patients being regularly assessed for psychological needs, so that these can be rapidly addressed.[24]

Rigorous and relevant evidence is now urgently needed to reduce the burden of serious psychological morbidity on critical care patients and their carers, and cost effective strategies are needed to reduce the burden on the NHS.

The modification of clinical risk factors for PTSD such as duration of mechanical ventilation and sedation have been discussed in the literature[25, 26], but less invasive medical interventions or better drugs are not currently available. Yet little high-quality research has been conducted to evaluate psychological interventions that could alleviate the emotional distress experienced by patients in critical care, with a view to preventing longer-term psychological morbidity.[27] An unpublished systematic review of 18 studies found mostly weak and some moderate evidence that psychosocial interventions including music therapy, complementary therapy, psychotherapy or patient diaries could reduce short-term or medium-term distress for critical care unit patients. Only the patient diary intervention[28] and a psychotherapeutic intervention[29] were shown to have an effect on longer-term psychological outcomes in a sufficiently large sample. However, the diary

intervention targets critical care unit patients' memory gaps rather than stress, and has been critiqued for its lack of a solid psychological theoretical underpinning.[30]

Recent advances in the study of critical care psychology have made the evaluation of psychological interventions for the critically ill more feasible. Valid psychological assessment tools now exist for use with critical care patients (e.g. Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)[31]), including a tool measuring critical care-related distress (the Intensive care Psychological Assessment Tool (IPAT, Appendix B) that was developed and validated by our research team.[32] With respect to the best timing to provide psychological interventions for critical illness survivors, research suggests that post-discharge (e.g. at six weeks[33] or at outpatient follow-up clinics[20]) may be too late, and earlier intervention could be more beneficial. For example, a study with critically ill trauma patients indicated that considerably fewer individuals experienced PTSD, depression or anxiety a year after critical care unit stay, having received interventions by practitioner psychologists while in the critical care unit.[29] In today's NHS, practitioner psychologists are a scarce resource, and a more pragmatic approach would be to standardise brief evidence-based psychological interventions to be carried out by existing critical care unit staff, who would be given the necessary training.

Aiming to develop a nurse-led psychological intervention for critical care unit patients that would commence before they leave the unit, our research team has identified the most relevant, up-to-date evidence concerning psychological techniques that are effective in: a) reducing acute emotional distress; b) reducing the impact of unusual experiences such as hallucinations and delusions; and c) preventing PTSD after a trauma (psychological problems commonly associated with admission to the critical care unit). The evidence is summarised below:

Interventions comprising Cognitive Behavioural Therapy (CBT) techniques have been found to be effective in reducing many types of emotional distress in both physical and mental health settings. Studies have evaluated CBT as effective even when delivered in brief form, or by non-expert staff (including nurses) who receive specific training. For example, a randomised controlled trial (RCT) showed that twice as many patients with excessive health anxiety (HA) who received brief CBT from newly-trained, non-expert clinical staff in medical clinics, achieved normal HA levels, compared to a control group.[34]

A specific CBT model has also proved effective in reducing the impact of symptoms such as hallucinations and delusions in patients with psychosis.[35-40] CBT for psychosis (CBTp) interventions have proved to be particularly effective in cases of early, first episode or acute psychosis, which equate most closely to the critical care unit experience.[41, 42] Recent CBTp research has demonstrated the efficacy of brief interventions, targeting specific symptoms such as delusions.[43] CBTp has also been successfully delivered by nurses and other non-expert therapists to patients with psychosis in mental health settings.[44-46]

Finally RCTs have shown CBT to be the most effective psychological intervention in reducing PTSD symptoms following different types of trauma, including episodes of psychosis.[47, 48] There is also increasing evidence that *early* interventions soon after a trauma may help to *prevent* PTSD symptoms from developing in the longer-term. A recent update to the NICE PTSD guidelines[49] states specifically that a brief trauma-focused psychological intervention of three sessions, delivered in the period immediately after a trauma, may reduce the development of subsequent PTSD symptoms.

Given that these existing evidence-based psychological interventions could be modified to reduce the stress and trauma experienced by critical care unit patients, and be delivered by specially trained, well-motivated critical care unit nurses, there is an urgent need to evaluate their effectiveness in the critical care unit setting. Increasing psychological support may also provide a further benefit to patients and the NHS by permitting a reduction in use and duration of pharmacological sedation.

The POPPI cluster-RCT was preceded by a Feasibility Study (ISRCTN61088114) looking at feasibility of both the intervention and the RCT processes. These feasibility studies informed this protocol for the POPPI cluster-RCT.

## 2.2 Aim

The aim of POPPI is to evaluate the clinical and cost-effectiveness of a complex nurse-led preventative psychological intervention in reducing patient-reported post-traumatic stress disorder (PTSD) symptom severity, and other reported psychological morbidities, at six months.

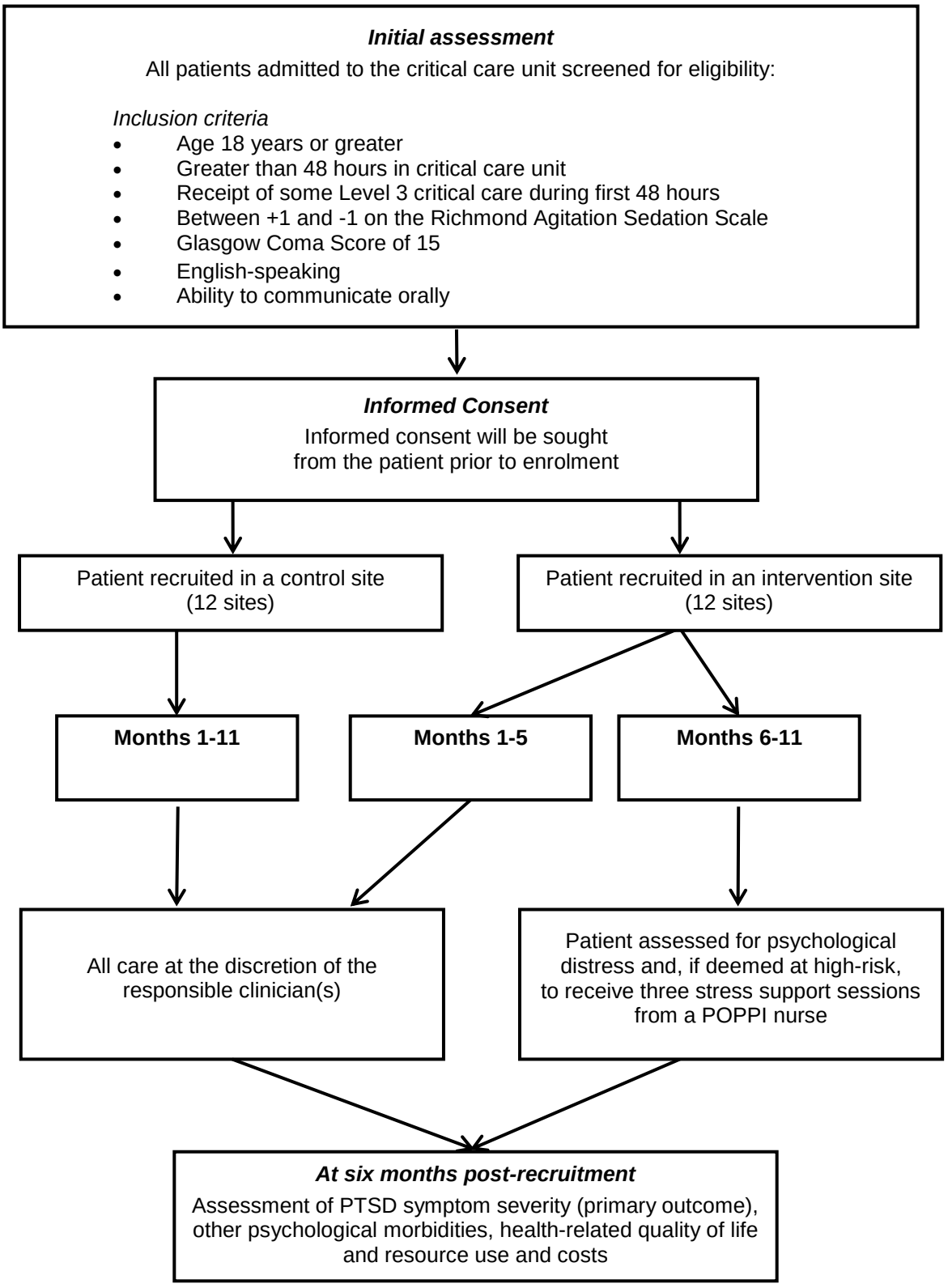
## 2.3 Objectives

- To evaluate the effect of the complex intervention on patient-reported PTSD symptom severity and other psychological morbidities and quality of life at six months; and
- To estimate, in an integrated economic analysis, the cost-effectiveness of the intervention.

An integrated process evaluation will be conducted to assess the fidelity and quality of the implementation of the intervention, and identify important contextual factors to better understand how the intervention works.

## 2.4 Trial schema

**Figure 1. Overview of patient journey**



# 3 Trial design

Parallel group cluster-RCT.

## 3.1 Setting

Twenty-four NHS adult, general, critical care units in the UK ('sites').

### 3.1.1 Site selection

The following criteria must be met for a site to participate in POPPI – a site must:

- show that recruitment to target, timely data collection, and delivery of the complex intervention are feasible - via completion of a site feasibility questionnaire;
- commit to dedicate adequate resources to carry out the complex intervention;
- agree to adhere to randomisation into either the control group or the intervention group;
- have two Joint Principal Investigators (PIs) identified to lead POPPI at the site (a lead nurse and a lead clinician);
- agree, where possible, to recruit all eligible patients to POPPI and to maintain a POPPI Screening Log to include reasons why eligible patients were not recruited
- agree to use the CAM-ICU for assessing delirium and RASS for assessing sedation status for the duration of the trial; and
- be actively participating in the Case Mix Programme (CMP) – the national clinical audit for critical care units coordinated by ICNARC.

Sites who have taken part as an intervention site in the POPPI Feasibility Study (ISRCTN61088114) will not be eligible for selection.

## 3.2 Trial timeline

Sites will be open to recruitment in three groups of eight sites at two month intervals (see Figure 2). At the start of month two the group of eight sites will be randomised to be either intervention or control sites (four intervention; four control). Each site will recruit patients for a total of between 13 to 17 months (see Figure 2) following the below schedule.

### *Control group sites*

**Months 1-17:** Usual care period (See section 5)

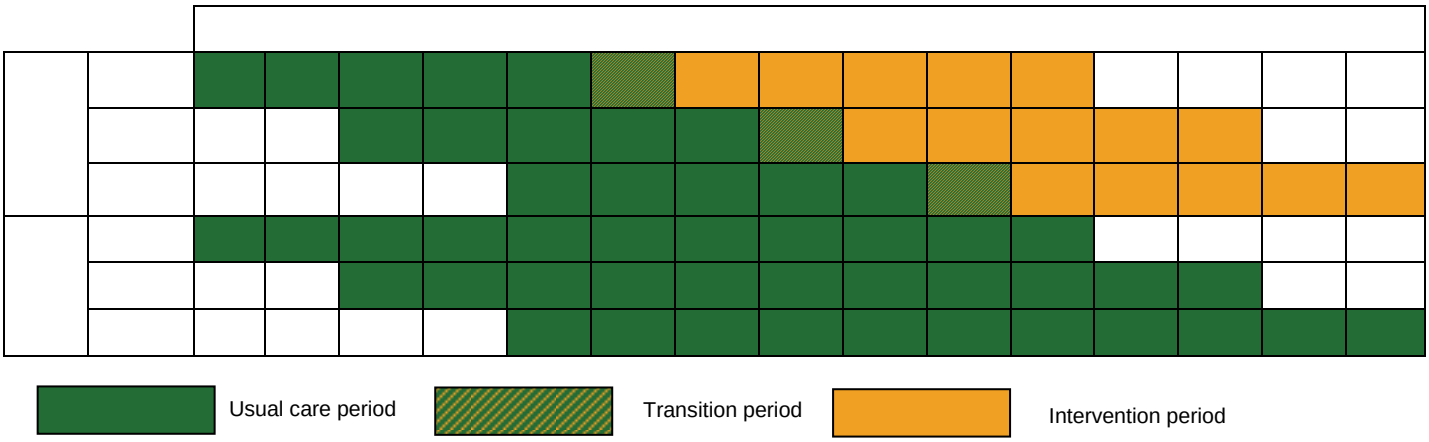
### *Intervention group sites*

**Months 1-5:** Usual care period (See section 5)

**Month 6:** Transition period (See section 7), during which intervention sites will undergo training and transition to delivering the intervention.

**Month 7-17:** Intervention period (See sections 7-8), in which the sites will deliver the full complex intervention.

**Figure 2. Cluster–RCT schedule**



Usual care period  Transition period  Intervention period

| | | Trial timeline (months) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intervention group sites | 1-4 | 1 | | | | | 6 | | | | | | | | | | | 17 |
| | 5-8 | | | 1 | | | | | 6 | | | | | | | | | 15 |
| | 9-12 | | | | | 1 | | | | | 6 | | | | | | | 13 |
| Control group sites | 1-4 | 1 | | | | | | | | | | | | | | | | 17 |
| | 5-8 | | | 1 | | | | | | | | | | | | | | 15 |
| | 9-12 | | | | | 1 | | | | | | | | | | | | 13 |

## 3.3 Site activation

Once the ICNARC CTU have confirmed that all necessary documentation is in place (including signed Clinical Trial Site Agreement (CTSA) and local NHS permissions), a site activation e-mail will be issued to the PI outlining a date at which the site is to start screening and recruitment. Sites will undergo a site initiation meeting prior to commencing recruitment. All sites responsibilities are outlined in the CTSA.

## 3.4 Randomisation of sites

The 24 sites will be randomly assigned to either the intervention group (N=12) or the control group (N=12) using a restricted randomisation approach to ensure balance across the groups in geographical location, teaching status and size of unit. This will be completed at the start of month two.

It is necessary to randomise on a cluster, rather than individual, level to avoid contamination of usual care as it would not be possible to restrict parts of the intervention to individual patients.

## 3.5 Selection of POPPI nurses – intervention sites only

All intervention group sites will be responsible for selecting the POPPI nurses following a personal specification provided to the site. All POPPI nurses will be required to sign a commitment form. This will include the following criteria:

- Be an expert practitioner in critical care
- Have excellent inter-personal skills
- Excellent communicator
- Able to take a flexible approach to their work
- Have an interest in improving critical care unit patients' psychological outcomes
- Able to attend the POPPI nurse training course
- Committed to deliver the intervention for duration of intervention period
- Committed to support the rest of the critical care unit team in delivering the intervention

# 4 Patient recruitment

## 4.1 Patient eligibility

Patients admitted to participating NHS adult, general, critical care units and meeting the following criteria are eligible for recruitment into POPPI. Patients must meet the eligibility criteria prior to discharge from the critical care unit.

### 4.1.1 Inclusion criteria

Patients must meet all of the following criteria:

- Age 18 years or greater
- Greater than 48 hours in the critical care unit
- Receipt of Level 3 critical care (for any period of time) during first 48 hours in the critical care unit
- Between +1 and -1 on the Richmond Agitation Sedation Scale[50]
- Glasgow Coma Scale score of 15
- English-speaking
- Ability to communicate orally

### 4.1.2 Exclusion criteria

Patients must not meet any of the following criteria:

- Pre-existing chronic cognitive impairment, such as dementia
- Pre-existing psychotic illness, such as schizophrenia
- Pre-existing chronic posttraumatic stress disorder
- Receiving end-of-life care
- Previously recruited to POPPI

## 4.2 Informed Consent

All patients will be routinely screened for eligibility by unit staff. Patients who meet the eligibility criteria will be invited to take part in the trial.

The patient will be provided with written information about the trial which will be supplemented with information provided orally. Patients will be given a copy of the relevant Patient Information Sheet (different versions will be used for the Usual care period, and Transition/Intervention periods) and, if preferred, a shorter Patient Information Leaflet alongside the Patient Information Sheet.

This decision to also offer a shorter Patient Information Leaflet was made considering the severity of critical care unit patients' illness. In particular, it is likely that many patients may find it easier to read or have read to them the Patient Information Leaflet initially, which is a shorter version of the written information. This leaflet will refer the patient to the Patient Information Sheet for full details of the trial. All patients will receive the Patient Information Sheet prior to providing Informed Consent.

The information provided to patients will include: details about the purpose of the trial; how the trial is being funded; the consequences of taking part or not; and data security. The contact details for the local Principal Investigators (PI) will be included on both the Patient Information Sheet and Patient Information Leaflet. Patients will be given the opportunity to ask questions and to discuss the trial with family or friends before making their decision.

After the authorised staff member is satisfied that the Patient Information Sheet has been read and understood, and any questions have been adequately answered, patients will be invited to sign the Consent Form. Once the patient has signed the Consent Form, the person taking informed consent will add their own name and countersign the Consent Form in the presence of the patient.

A copy of the signed Consent Form will be given to the patient, a copy placed in the Investigator Site File (ISF) with the original placed in the patient's medical notes.

Standard Operating Procedures (SOPs) for screening and the informed consent process will be provided in the ISF.

# 5 Usual care period - patients

## 5.1 Overview

- Control sites will deliver usual care during months 1 to 17.
- Intervention sites will deliver usual care during months 1 to 5.

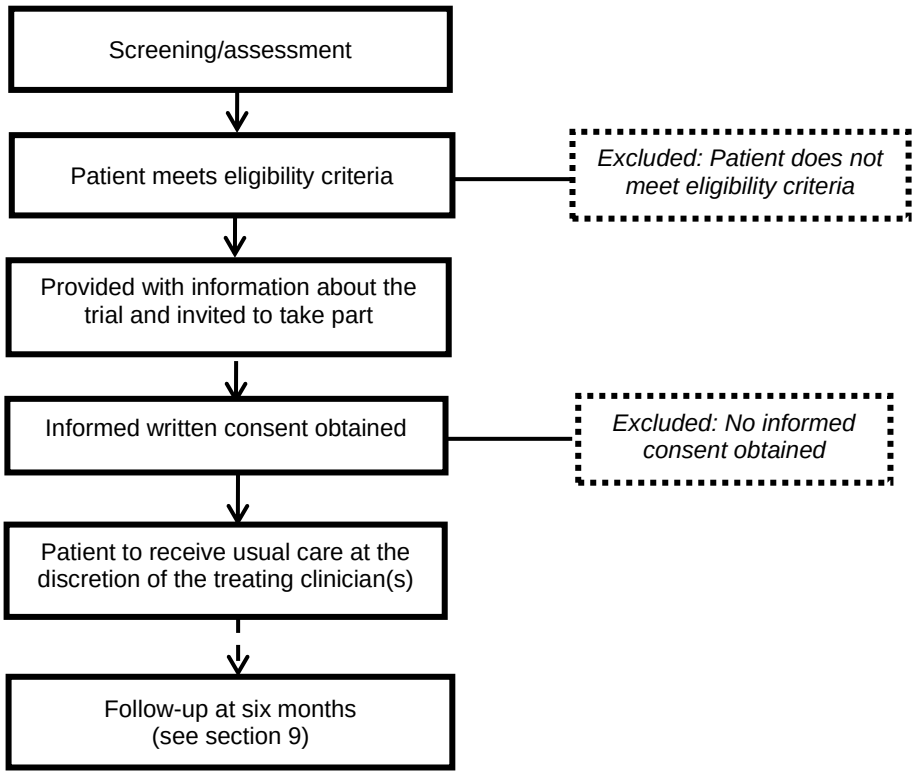
## 5.2 Definition of usual care

Patients should receive psychological support or treatment at the discretion of the treating clinician(s) following standard practice at their site.

## 5.3 Patient timeline

During the usual care period, eligible, consenting patients will receive usual care at the discretion of the treating clinician(s). Patients will be sent questionnaires six months after providing informed consent (see section 9 for further details).

**Figure 3. Patient timeline during usual care**




# 6 Intervention

The POPPI trial involves a complex intervention comprising four related elements:

1) An education package (two training courses and associated materials) to train critical care unit staff to carry out elements 2-4 below;
2) Creating a therapeutic environment to promote calm and minimise stress in the critical care unit (all critical care unit staff);
3) Assessing for acute psychological stress and unusual experiences in critical care unit patients using the IPAT (research staff);
4) Carrying out three, one-to-one CBT-inspired stress support sessions, for patients assessed as acutely stressed and at high-risk of psychological morbidity (delivered by specially trained POPPI nurses).

# 7 Transition period – site staff

All the procedures described in this section are relevant only to the intervention sites between months 6 to 17.

## 7.1 Overview

After the first five months of recruitment, intervention sites will undergo a transition period, during which they will transition from delivering usual care to delivering the complex intervention. Following the transition period, the full complex intervention will be delivered until the end of the recruitment period.

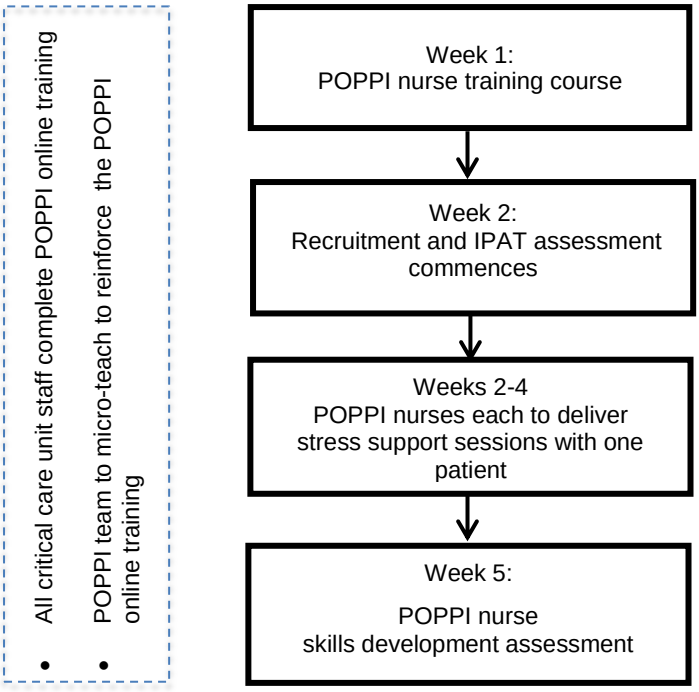
The transition period occurs during month 6 at each Intervention site and has the following aims:

- The POPPI nurses to attend a three day central training course (see section 7.3*)*.
- Development of a therapeutic environment, with critical care unit staff completing the POPPI online training (see section 7.4)
- Assess all consented patients using the IPAT (section 8.3)
- Each POPPI nurse to deliver stress support sessions with at least one patient (see section 7.5)
- Confirmation of POPPI nurses skills development (section 7.5).

## 7.2 Site timeline during transition period

At the beginning of the transition period all POPPI nurses at a site will attend the three-day central POPPI nurse training course. After completing the course, the POPPI nurses will return to their critical care units where screening and consenting eligible patients will commence (as per the flow in section 8.2). Each nurse should deliver stress support sessions (see: Section 8.4) to at least one consented patient, identified (using the IPAT) as being stressed and at high risk of psychological morbidity. In parallel, the POPPI nurses and research teams will also encourage culture change in their unit to create a therapeutic environment (see section 7.4) by ensuring all critical care staff complete the POPPI online training and through teaching at the bedside. At the end of this transition period, the POPPI nurses will undergo a skills development assessment.

**Figure 4. Site timeline during transition period**



## 7.3 POPPI nurse training course

This is a three-day training course to train the POPPI nurses in their new role. The course was designed by the trial team in consultation with experts in medical education and CBT training, and is delivered by two senior nurses and a psychologist. The main focus of the training course is on learning and practising new skills required to deliver the stress support sessions with patients.

The POPPI nurse role also includes encouraging all staff in their units to complete the POPPI online training; promoting the screening of patients with the IPAT; and teaching good communication skills and psychological care (reinforcing key messages from the POPPI online training) at the bedside and training on these aspects of the role will also be provided. These tasks will be completed in conjunction with the research team at each intervention site as a team approach.

Associated materials include a training folder; a POPPI nurse training manual on the three stress support sessions; a tablet computer with a "relax and recover" programme for nurses to use with patients; a self-help booklet and DVD for nurses to give to patients; and electronic materials will also be provided on a dedicated web page which only POPPI nurses will be able to access.

The course will cover:

- Psychological challenges of patients in the critical care unit (including patient representative talks and videos)
- CBT-based psychological support techniques required to deliver stress support sessions
- Content of stress support sessions
- Observe (in person and expert videos) example stress support sessions
- Practice stress support sessions

## 7.4 Creating a therapeutic environment

The POPPI team will create a therapeutic environment by encouraging culture change in their unit. This will be facilitated by ensuring all critical care unit staff complete the POPPI online training and by teaching good communication skills and psychological care at the bedside. In addition, they will ensure that POPPI materials are clearly displayed (e.g. posters) and distributed (e.g. pocket cards) throughout the unit.

### 7.4.1 POPPI online training

The POPPI team will register all critical care unit staff for the POPPI online training. The learning is designed to aid the creation of a calm, less stressful environment by using good communication in the unit and delivering enhanced psychological care to patients.

The POPPI online training takes approximately 30 minutes to complete and comprises five sections:

1. Understanding the stresses of intensive care patients
2. Reducing stress and fear in patients
3. Communicating with distressed patients
4. Inspiring patients with confidence and hope
5. Summary and assessment.

### 7.5 Supervision for POPPI nurses

All POPPI nurses will be allocated a supervisor from the POPPI training team to ensure they are supported by experts during the transition and intervention periods.

Supervision will focus on specific cases, and be aimed at improving POPPI nurses' skills in delivering the stress support sessions. Initial supervision will be carried out once a POPPI nurse has delivered stress support sessions to their first patient. Once all POPPI nurses at the site have delivered stress support sessions to one patient the POPPI training team will visit POPPI nurses in their units to offer further support and the POPPI nurses will undergo a skills development assessment to ensure they meet the required levels of delivering the stress support sessions. If necessary, further support and training will be offered prior to the delivery of further sessions with patients.

POPPI nurses will continue to receive supervision either via telephone call or site visit. If necessary, extra supervision will be provided.

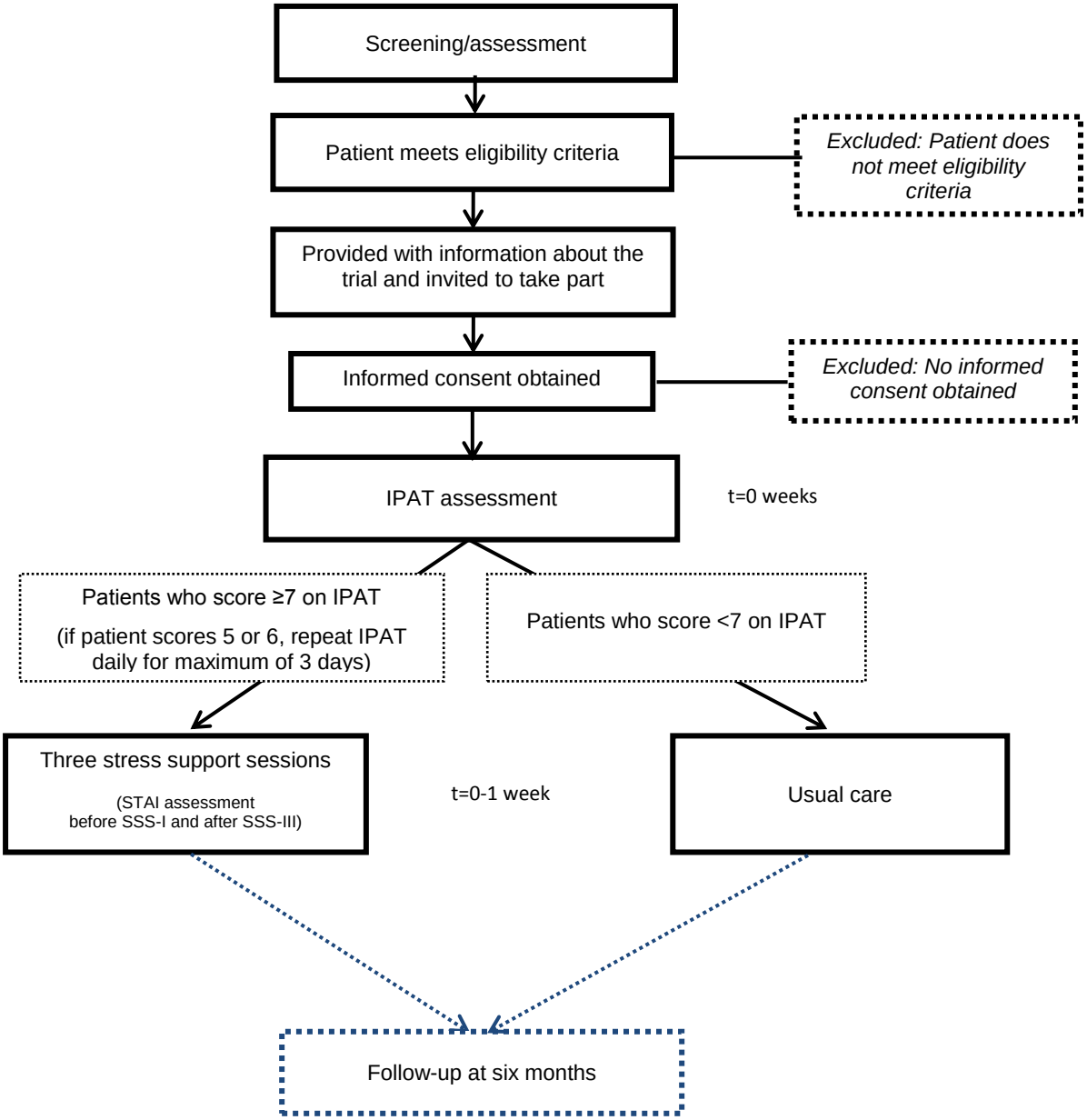
## 8 Transition and intervention periods – patients

### 8.1 Overview

Intervention sites will deliver the intervention (see section 6) to patients between months 6 to 17.

## 8.2 Patient timeline

**Figure 5. Patient timeline during intervention period**



## 8.3 IPAT assessment

The IPAT is a validated screening tool used to detect acute psychological stress and unusual experiences such as hallucinations in critically ill patients[51] (see Appendix B). Consented, eligible patients will be assessed using the IPAT by a trained authorised staff member (as per the Delegation Log) as soon as possible, but within 48 hours of consent being provided. A patient is deemed high-risk if they score seven or more on the IPAT and should be referred, as soon as possible, to a POPPI nurse to receive the three stress support sessions (see section 8.4). Patients who score less than seven on the IPAT will continue to receive usual care as determined by the treating clinician(s). If the patient scores five or six on the IPAT they should be reassessed daily, for a maximum of three days, until they either leave the critical care unit or the score drops below five.

## 8.4 Stress support sessions

The aims of the stress support sessions are:

- to reduce acute stress, fear and intrusive memories of the critical care unit before the patient leaves hospital; and
- to help patients find a path to psychological recovery and well-being after their stay in the critical care unit.

### 8.4.1 Delivery of stress support sessions

The three stress support sessions are to be delivered by the same POPPI nurse ideally within one week, with the first stress support session starting as soon as possible, but within 48 hours following IPAT assessment. Each session lasts approximately 30 minutes. If a patient shows signs of distress or fatigue, the session can be stopped and a new visit can be arranged at a more appropriate time.

The State Trait Anxiety Inventory (STAI, see Appendix C) will be used to assess the patients anxiety prior to session one and at the end of stress support session three. If a patient is showing serious signs of distress at the end of their three sessions, their medical team will be informed.

### 8.4.2 Objectives of stress support sessions

The POPPI nurses' objectives during the stress support sessions are to:

- develop a trusting relationship with the patient;
- help a patient understand the links between the experience of being in the critical care unit and a range of common psychological reactions which are often disturbing;
- increase patients' sense of control by creating opportunities to talk about psychological reactions in the critical care unit and to take an active part in managing these;
- describe and demonstrate strategies for coping with stress (e.g. listening to music and using relaxation and mindfulness techniques on the supplied tablet computer);
- re-evaluate stressful thoughts;
- reduce patients' hopelessness through watching other patients' recovery stories; and
- build on evidence of progress and getting better.

### 8.4.3 Components of stress support sessions

There are three common components to each stress support session: Start; Building Rapport; and Finish. In addition, each stress support session includes three additional components and is structured as follows:

Stress support session one – helping patients understand and cope with stress

- Normalise psychological reactions
- Encourage communication
- Teach coping strategies

Stress support session two – managing frightening thoughts from critical care

- Stress reactions
- Explain stressful thinking
- Teaching “check out my fear” technique

Stress support session three – creating confidence and hope for a good recovery

- Summarise key messages and review
- Action plan
- Future expectations

## 8.5 Audio-recording sessions

After the transition period, a sample of consented patients who have been assessed as being at high risk of psychological morbidity will be asked to consent to their stress support sessions being audio-recorded. If a patient agrees to their stress support sessions being audio-taped they will be asked to sign the Audio-recording Consent Form. This is optional and will not preclude the patient taking part in the trial or delivery of the stress support sessions. Audio recordings will be reviewed by the training team, in order to monitor treatment fidelity of the stress support sessions delivered, and will be destroyed at the end of the trial. If a patient withdraws consent for use of their session to be audio-recorded, then the audio file will be deleted and no longer used.

# 9 Patient follow-up

Six months after recruitment, consented patients will be asked to complete questionnaires on psychological distress, mood, health-related quality of life and use of health services. In particular, the questionnaires will include measures of PTSD symptom severity (using the PTSD Symptom Scale – Self-Report version (PSS-SR)[53] - see Appendix D), depression and anxiety (using the Hospital Anxiety and Depression Scale (HADS)[54] – see Appendix E), health-related quality of life (using the EuroQoL EQ-5D-5L – see Appendix F) and health services resource use (using Health Services Questionnaire – see Appendix G). Patients will be sent the questionnaires by post (including a stamp addressed envelope and a pen) by ICNARC CTU. Non-responders will be telephoned three weeks later, and asked to check whether they have received the questionnaire. If preferable for the patient, they will be given the option to complete the questionnaire over the telephone. If completed follow-up questionnaires, received by ICNARC CTU, indicate the presence of signs of serious stress or low mood, a referral letter from Dr Wade, Lead Clinical Investigator, will be sent to the patient's General Practitioner (GP) and the recruiting site (if requested).

# 10 Outcomes

## 10.1 Primary outcomes

### 10.1.1 Clinical evaluation

The primary outcome for the clinical evaluation will be patient-reported PTSD symptom severity at six months, measured using the PSS-SR, which conforms to all DSM-IV diagnostic criteria for PTSD and which has been validated for use in critical care unit survivors.

### 10.1.2 Economic evaluation

The primary outcomes for the economic evaluation will be incremental costs (cost-effectiveness analysis (CEA)), quality-adjusted life years (QALYs) and net monetary benefit at six months.

## 10.2 Secondary outcomes

Secondary outcomes will be:

- days alive and free from sedation to day 30;
- duration of critical care unit stay;
- PSS-SR greater than 18 points at six months;[55]
- depression at six months, measured using the Hospital Anxiety and Depression Scale (HADS);
- anxiety at six months, measured using the HADS; and
- health-related quality of life (HRQoL) at six months, measured by the EuroQol (EQ-5D-5L) questionnaire.

# 11 Power calculation

## 11.1 Pre-trial power calculation

The power calculation was completed using the approach of Hussey & Hughes (2007)[56] to achieve 90% power to detect a reduction from 6 points to 3.1 points ($p<0.05$) in the mean PSS-SR at six months, and was based on the following assumptions:

- Mean (6) and standard deviation (7.5) of the PSS-SR were taken from patients in the feasibility study.
- Estimated intra-cluster correlation (ICC) of 0.138 – between-site coefficient of variation 0.5 corresponding to between-site standard deviation 3 (conservative estimate as no multicentre data available).[57] Note: the inclusion of a baseline recruitment period means that the sample size calculation is less sensitive to the degree of clustering.[56]
- Treatment effect of a reduction of 2.9 points on the PSS-SR based on: reliable change index for the PSS-SR of 8.6 points[58] being observed in 40% of eligible patients in the intervention periods assessed as being at high risk of psychological morbidity using the IPAT, with 16% of recruiting patients declining the intervention.[32].
- Harmonic mean of the number of patients completing follow-up (52 per site per annum – corresponding to 22 in a five-month period) based on data from the CMP.

With the design and the above assumptions, the estimated total number of patients recruited (based on CMP data) for the RCT would be 1,914 patients from the twenty-four sites. It is anticipated that 438 will be assessed using the IPAT, of which 175 (40%) will be assessed as being at high risk of psychological morbidity and receive the stress support sessions.

## 11.2 Final review of assumptions in pre-trial power calculation

During recruitment, in consultation with the TSC and DMEC, a review of assumptions underlying the pre-trial power calculation once outcome data were available for patients recruited during the five-month baseline period in both intervention and control sites. This review, undertaken using data available on 9 August 2016, identified the following re-estimation of the assumptions:

- Mean (10.3) and standard deviation (10.8) of the PSS-SR.
- ICC of 0.087 (95% confidence interval 0 to 0.192) [with mean, standard deviation and ICC estimated using all available data from the previous observational study, the feasibility study and the baseline period of the cluster-RCT]
- Treatment effect of a reduction of 4.2 points on the PSS-SR – estimated by retaining the same effect size as a multiple of the within-site standard deviation.
- Harmonic mean of the number of patients completing follow-up (30.7 per site per annum – corresponding to 12.8 in a five-month period) estimated using observed data from the baseline period.

This review of assumptions established that the planned design had an anticipated 78% power under the observed parameter estimates (allowing for uncertainty in the between-site variation, between 73% and 85% power).

Consequently, the decision was taken to extend recruitment in all sites to the end of planned recruitment in stagger 3 sites (corresponding to an harmonic mean of 16.5 patients completing follow-up per site during the intervention period, allowing for the variation from five months to nine months duration across staggers). With this extension to recruitment, the planned design had an anticipated 85% power (allowing for uncertainty in the between-site variation, between 79% and 91% power). It was anticipated that, with this extension to recruitment, the estimated total number of patients recruited would be 1,378. Recruitment continued to be

monitored to ensure 1,378 or more patients were recruited. A final decision to extend recruitment by an additional two months in all sites was taken to ensure this minimum number was achieved.

# 12 Data collection and management

## 12.1 Data collection – patients

The following data is to be collected by site staff whilst the patient is in-hospital. These data must be transcribed onto the paper Case Report Forms (CRF) (provided to sites) prior to entering onto the secure electronic CRF (eCRF). The original paper CRFs must be kept at site. All entries must be clear and legible. The use of abbreviations and acronyms must be avoided. The PI is responsible for the accuracy of all data reported in the paper CRF. All paper CRFs must be completed and signed by staff listed on the Delegation Log and authorised by the PI to perform this duty.

Any corrections made to a paper CRF at site must be made by drawing a single line through the incorrect item ensuring that the previous entry is not obscured. Each correction must be dated and initialled. Correction fluid must not be used. The amended paper CRF must be retained securely at site. These changes must also be made on the eCRF.

Security of the eCRF is maintained through user names and individual permissions approved centrally by ICNARC CTU. Central back-up procedures are in place. Storage and handling of confidential trial data and documents will be in accordance with the Data Protection Act.

Data collected for all patients:

**Patient details**

- Identifiers
- Sociodemographics

**Baseline data**

- Date and time of critical care unit admission
- Eligibility criteria
- Date and time of consent
- Illness severity scores (including quality of life)
- Prior delirium (assessed by CAM-ICU), anxiety or depression

**Critical care unit stay data**

- Delirium
- Drugs received
    - Sedatives, anxiolytics, anaesthetics, sleep medications, antipsychotics, analgesics, anti-depressants and vasoactive agents
- Mechanical ventilation received

**Hospital discharge data**

- Discharge status
- Discharge date/date and time of death

Data collected for patients recruited during the intervention period:

**POPPI Intervention data**

- IPAT score
- STAI scores before stress support session one and after stress support session three
- Delivery of the stress support sessions

The following data is to be collected by questionnaires sent directly to all patients. The detailed process for collection is outlined in section 7. Patients will also be given the opportunity to feed back their experiences of the stress support sessions via email or an online form.

**Follow-up data**

- PSS-SR
- HADS
- EQ-5D-5L
- Health Services Questionnaire

In addition, data will be linked to the CMP, the national clinical audit of adult critical care coordinated by ICNARC, which is ongoing in all adult, general critical care units in England, Wales and Northern Ireland. Linked data will include demographics, surgical status, acute severity of illness and duration of organ support and duration of critical care unit stay. Support for the collection and use of patient identifiable data has been approved for the CMP by the Patient Information Advisory Group (PIAG) under Section 251 of the NHS Act 2006 (originally enacted under Section 60 of the Health and Social Care Act 2001) – Approval Number: PIAG 2-10(f)/2005. Section 251 support is reviewed annually by PIAG and covers all aspects of data management including data security.

On entry into the study, the patient's GP will be sent a letter confirming recruitment. This will also include a form that can be completed to the returned to the ICNARC CTU if the GP is aware of any new mental health difficulty that has arisen since recruitment onto the study.

**Table 1 Patient data collection schedule**

| | Baseline (at point of recruitment) | End of critical care unit stay | Intervention sites only | | | Six months post-recruitment |
|---|---|---|---|---|---|---|
| | | | Before SSS-I | During sessions | After SSS-III | |
| *Collected in-hospital* | | | | | | |
| **Patient details** | ✓ | | | | | |
| **Clinical data** | ✓ | | | | | |
| **Critical care unit stay data** | | ✓ | | | | |
| **IPAT** | | | ✓ | | | |
| **Delivery of stress support sessions** | | | | ✓ | | |
| **STAI** | | | | | ✓ | |
| *Follow-up questionnaires sent to patients* | | | | | | |
| **PSS-SR** | | | | | | ✓ |
| **HADS** | | | | | | ✓ |
| **EQ-5D-5L** | | | | | | ✓ |
| **Health Services Questionnaire** | | | | | | ✓ |

### 12.1.2 Data management

The ICNARC CTU will work closely with staff at participating sites to ensure accurate (complete, valid and reliable) data. Extensive completeness, range and consistency checks will further enhance the quality of the data. Two levels of data validation will be incorporated into the eCRF. The first prevents obviously erroneous data from being entered, e.g. entering a date of birth that occurred after the date of consent. The second level checks for data completeness and any unusual data entered, e.g. a physiological variable, such as blood pressure, that was outside of the pre-defined range. Site staff will be able to generate data validation reports, listing all outstanding data queries, at any time via the eCRF. The site PI is responsible for ensuring that all data queries are resolved. Ongoing data entry, validation at adherence to the trial protocol at sites will be closely monitored by ICNARC CTU and any concerns will be raised with the site PI.

## 12.2 Data collection – sites

Prior to randomisation the following data will be collected, via the process evaluation, for each participating site:

- Provision of current psychological support
- Layout of critical care unit

## 12.3 Data collection – site staff

The following data will be collected on the site staff's participation in POPPI – only applicable to the intervention sites:

POPPI nurses

- Basic demographic data
- Self-efficacy questionnaire – completed by POPPI nurses prior to and after POPPI nurse Training course
- Skills development assessment scale – completed by assessors

All staff data

- End of POPPI online training: number (%) and demographics of critical care staff completing course; knowledge test; number of attempts to pass knowledge test and number (%) of those who passed the test.

## 12.4 Process evaluation

The process evaluation for intervention sites will consider both quantitative and qualitative data.

Quantitative data will include assessments of nurse competence following the training course, and treatment fidelity of the stress support sessions. In particular, treatment fidelity will be assessed with a purpose-built measure of adherence to therapy assessed by independent reviewers based on a random sample of sessions digitally recorded by the POPPI nurses and sent centrally for evaluation.

The process evaluation will also incorporate site visits to intervention sites to observe and discuss the delivery of the intervention with the POPPI nurses and wider critical care unit staff. Each intervention site will receive a visit from the POPPI training team during the intervention period. The site visit will assess the delivery of three elements of the intervention:

- the therapeutic approach to interaction with critical care unit patients
- routine assessment of acute psychological distress using the IPAT
- stress support sessions

Qualitative data will be collected in the form of researcher observations, interviews with staff and structured field notes.

## 12.5 Monitoring

Sites must agree to allow trial-related monitoring and audits by providing direct access to source data/documents, as required. Patients' informed consent for this will also be obtained. Frequency of monitoring visits will be outlined in the POPPI Monitoring Plan and will consist of all sites visited at least once to monitor recruitment and adherence with the trial protocol. Additional on-site monitoring visits may be scheduled where there is evidence or suspicion of non-adherence by a site to important aspect(s) of the trial requirements.

Following the monitoring visit, the ICNARC CTU will provide the site with a monitoring report, which will summarise the documents reviewed, along with any findings. The PI at each site will be responsible for ensuring that the findings from the monitoring visit are addressed.

# 13 Statistical methods

## 13.1 Statistical methods – clinical effectiveness

The primary analysis for the clinical evaluation will determine if there is a significant difference in the mean PSS-SR at six months between patients recruited during the intervention period in intervention sites compared with control sites of the cluster-RCT using a generalised linear mixed model (GLMM) at the individual patient level (patients nested within sites and time periods) including a random effect of site and a fixed effect of period (baseline or intervention), and adjusted for site-level factors included within the restricted randomisation algorithm.

For the primary outcome, the link function will be the identity link (i.e. linear regression) and standard errors will be estimated using robust variance method, to ensure that deviations from the model's assumption such as non-linear relationship between exposure and outcome as well as over/under dispersion of data are adjusted for to provide meaningful precision estimates .[69]

A secondary analysis will adjust for pre-specified baseline factors associated with poor psychological outcome (e.g. sedation) and ability to resource and deliver the intervention (e.g. size of critical care unit, teaching status) at both patient and site level. Results of the GLMMs will be reported as differences in means, 95% confidence intervals (CIs) and p-values.

Analyses of secondary outcomes will be conducted using GLMMs, with the identity link (i.e. linear regression) for continuous secondary outcomes, reported as differences in means with 95% CI and the logit link (i.e. logistic regression) for binary secondary outcomes, reported as odds ratios with 95% CI.

The above analyses will evaluate the effectiveness of the intervention among all patients meeting the inclusion criteria and consenting to follow-up, based on the intention to treat principle. A further secondary analysis will use structural mean models with an instrumental variable of allocated treatment to estimate the efficacy (adherence adjusted causal effect) of the stress support sessions among those patients consenting to psychological assessment and stress support sessions, assessed as being at high risk of psychological morbidity and receiving stress support sessions.[59]

## 13.2 Statistical methods – process evaluation

Analysis of the process evaluation will use a combination of qualitative and quantitative methods to assess and describe the variation in the delivery of the intervention across sites.[60] Analysis of the process evaluation will be conducted before the outcome evaluation to avoid any bias in the interpretation of the process data and to generate hypotheses that may be subsequently tested in statistical analyses of integrated process and outcome data. The structural mean models described above will be extended to incorporate additional potential mediator variables on the causal pathway between treatment allocation and treatment effect, e.g. nurse competence following training, adherence to the therapeutic approach and adherence to therapy.[61]

## 13.3 Statistical methods – cost-effectiveness

A full CEA will be undertaken to assess the relative cost-effectiveness of psychological assessment followed by stress support sessions for those assessed as being at high risk of psychological morbidity, versus usual care. Resource use and outcome data collected as part of the cluster-RCT will be used to report cost-effectiveness at six months and to project the lifetime cost-effectiveness of each strategy.

The cost analysis will take a health and personal health services perspective. Resource use data from the site visits, cluster-RCT dataset and six-month questionnaires will be combined with unit costs from the NHS

Payment by Results database and from local Trust Finance Departments, to report the total costs per patient at six months for intervention versus usual care.[62, 63]

HRQoL data from the EQ-5D-5L questionnaires at six months will be combined with survival data using linear interpolation to report QALYs at six months. The CEA will report the mean (95% confidence interval) incremental costs, QALYs and net monetary benefit at six months.

The CEA will use multilevel linear regression models that allow for clustering[64] including a random effect of site and a fixed effect of period. The analysis will adjust for pre-specified baseline covariates at both patient and site level.

Lifetime cost-effectiveness will be projected using a decision model informed by the best evidence on long-term survival and HRQoL after critical care unit stay.[65, 66] The long-term modelling will extrapolate from the cluster-RCT data by fitting alternative parametric survival curves (e.g. Weibull, exponential, lognormal, log logistic and Gompertz) to the observed survival data. The chosen method of extrapolation for the base case will be the one judged most plausible.[67] In the base case, quality of life calculated at six months will be assumed to apply to each subsequent year of life, after allowing for decrements in quality of life according to advancing age. Predicted survival and HRQoL will be combined to report lifetime QALYs, and to project lifetime incremental costs, incremental QALYs, and incremental net benefits for the alternative strategies of care. Sensitivity analyses will test whether the results are robust to methodological assumptions (e.g. specification of the statistical model, extrapolation approach, alternative HRQoL assumptions, and learning curve effects).

# 14 Monitoring and oversight

## 14.1 Trial Management Group (TMG)

All day to day management of POPPI will be the responsibility of Professor Kathryn Rowan (Chief Investigator) and Paul Mouncey (Senior Trial Manager). Staff who work on POPPI (including the Trial Statistician, Jerome Wulff, and Assistant Trial Manager, Alvin Richards-Belle) will meet regularly to discuss, the progress of the trial and findings from other related research.

## 14.2 Trial Steering Committee (TSC)

The progress of the trial will be monitored and supervised by the TSC. At least 75% of the members will be independent (including the Chair). It will also consist of at least two service user representatives, the Chief Investigator and the Lead Clinical Investigator.

## 14.3 Data Monitoring and Ethics Committee (DMEC)

The DMEC will include experienced critical care clinicians and an experienced statistician. All members of the DMEC will be independent of both the trial and the TSC. The DMEC will operate under the DAMOCLES Charter[68],and will report to the TSC, making recommendations on the continuation, or not, of the trial.

## 14.4 Role of the ICNARC CTU

The ICNARC CTU will be responsible for the day to day management and coordination of the trial and will act as custodian of the data. The ICNARC CTU will ensure that all SAEs are appropriately reported to the REC.

# 15 Trial closure

## 15.1 End of trial

The end of the trial will be when the final patient has completed their six months follow-up. At which point the Declaration of End of Trial Form will be submitted to the participating ethical committee, as required.

## 15.2 Archiving of trial documentation

At the end of the trial, the ICNARC CTU will archive securely all centrally held trial related documentation for a minimum of 10 years. Arrangements for its confidential destruction will then be made. It is the responsibility of PIs at each site to keep data and all essential documents relating to the trial held at site for a minimum of 10 years after the end of the trial and in accordance with national legislation and for the maximum period of time permitted by the site, as per local policy.

Essential documents are those which enable both the conduct of the trial and the quality of the data produced to be evaluated and show whether the site complied with the principles of Good Clinical Practice (GCP) and all applicable regulatory requirements.

If a patient withdraws consent for any data to be used it will be confidentially destroyed.
The ICNARC CTU will notify sites when documentation held at sites may be archived. All archived documents must still be available for inspection and monitoring by appropriate authorities and the ICNARC CTU upon request.

## 15.3 Early discontinuation of trial

The trial may be stopped before completion by the TSC. This can be upon recommendation of the DMEC. Sites will be informed in writing by the ICNARC CTU of reasons for early closure and the actions to be taken with regard to treatment of patients. Patients should continue to be followed up as per protocol.

## 15.4 Withdrawal from trial participation by a site

Should a site choose to close to recruitment the PI must inform the ICNARC CTU in writing. Follow-up as per the protocol must continue for all patients recruited into POPPI at that site. Sites that contravene the POPPI Trial Protocol and the Clinical Trial Site Agreement will be subject to review by the TMG and Sponsor and may be suspended or closed down by the ICNARC CTU.

# 16 Ethical and regulatory compliance

## 16.1 Research ethics approval

This Protocol, Patient Information Sheets, Informed Consent Forms and other trial-related documents will be reviewed and approved by the Sponsor and Research Ethics Committee (REC) with respect to scientific content and compliance with applicable research regulations involving human subjects. Details of the informed consent procedure are reported in section 4.2.

### 16.2 Protocol amendments

Any modification to the protocol and/or trial-related documents which may impact on the conduct of the trial, potential benefit to patients or patient safety will require a formal amendment to the protocol. Such amendments will be agreed by the Sponsor, TMG and approved by the REC. Administrative changes of the protocol, which have no impact on the conduct of the trial or patient safety, will be agreed by the Sponsor and TMG. The REC will be notified but formal approval will not be required.

### 16.3 Confidentiality

The POPPI trial will be managed according to the Medical Research Council's (MRC) Guidelines for Good Clinical Practice in Clinical Trials and Good Research Practice: Principles and Guidelines, which are based on the principles of the International Conference on Harmonisation (ICH) GCP. The ICNARC CTU has developed its own policies and procedures, based on these MRC guidelines, for the conduct of all its research activities. In addition, ICNARC has contractual confidentiality agreements with all members of staff. Policies regarding alleged scientific misconduct and breach of confidentiality are reinforced by disciplinary procedures.

The ICNARC CTU will act to preserve patient confidentiality and will not disclose or reproduce any information by which patients could be identified. Any patient identifiable data leaving the hospital will be encrypted to ensure anonymity. All procedures for handling, processing, storing and destroying data are compliant with the Data Protection Act 1998.

### 16.4 Withdrawal of patients consent

In consenting to the trial, patients are consenting to assessments, intervention (where applicable), follow-up and data collection.

If a patient explicitly states their wish not to contribute further data to the trial their decision must be respected and the ICNARC CTU notified in writing. Details should be recorded in the patient's hospital records and no further trial data will be requested.

## 17 Dissemination policy

The progress and results of POPPI will be widely and actively disseminated. The results will be submitted to relevant peer-review journals for publication. They will also be presented at: national and international critical care and clinical and health psychology conferences/meetings; the Annual Meeting of the ICNARC Case Mix Programme; and the Annual Meeting of the UK Critical Care Research Forum.

A Study Report to the NIHR HS&DR programme will present a detailed description of the trial and the results along with recommendations for future policy, practice and research.

# 18 Sponsorship and Indemnity

ICNARC is the Sponsor for the POPPI cluster-RCT and holds professional indemnity insurance (Markel International Insurance Co Ltd) to meet the potential legal liability of the Sponsor and employees for harm to participants arising from the design and management of the research.

Indemnity to meet the potential legal liability of investigators/collaborators for harm to participants arising from the conduct of the research is provided by the NHS indemnity scheme or through professional indemnity.

# References


1. Wade DM, Howell DC, Weinman JA, Hardy RJ, Mythen MG, Brewin CR, et al. Investigating risk factors for psychological morbidity three months after intensive care: a prospective cohort study. Critical care (London, England). 2012;16(5):R192.
2. Ely EW, Siegel MD, Inouye SK. Delirium in the intensive care unit: an under-recognized syndrome of organ dysfunction. Seminars in respiratory and critical care medicine. 2001;22(2):115-26.
3. Wade D, Hardy R, Howell D, Mythen M. Identifying clinical and acute psychological risk factors for PTSD after critical care: a systematic review. Minerva anestesiologica. 2013;79(8):944-63.
4. Jones C, Backman C, Capuzzo M, Flaatten H, Rylander C, Griffiths RD. Precipitants of post-traumatic stress disorder following intensive care: a hypothesis generating study of diversity in care. Intensive care medicine. 2007;33(6):978-85.
5. Novaes MA, Knobel E, Bork AM, Pavao OF, Nogueira-Martins LA, Ferraz MB. Stressors in ICU: perception of the patient, relatives and health care team. Intensive care medicine. 1999;25(12):1421-6.
6. Jones C, Griffiths RD, Humphris G, Skirrow PM. Memory, delusions, and the development of acute posttraumatic stress disorder-related symptoms after intensive care. Critical care medicine. 2001;29(3):573-80.
7. Wade DM, Brewin CR, Howell DC, White E, Mythen MG, Weinman JA. Intrusive memories of hallucinations and delusions in traumatized intensive care patients: An interview study. British journal of health psychology. 2014.
8. Samuelson KA, Lundberg D, Fridlund B. Stressful memories and psychological distress in adult mechanically ventilated intensive care patients - a 2-month follow-up study. Acta anaesthesiologica Scandinavica. 2007;51(6):671-8.
9. Granja C, Gomes E, Amaro A, Ribeiro O, Jones C, Carneiro A, et al. Understanding posttraumatic stress disorder-related symptoms after critical care: the early illness amnesia hypothesis. Critical care medicine. 2008;36(10):2801-9.
10. Myhren H, Toien K, Ekeberg O, Karlsson S, Sandvik L, Stokland O. Patients' memory and psychological distress after ICU stay compared with expectations of the relatives. Intensive care medicine. 2009;35(12):2078-86.
11. Davydow DS, Zatzick D, Hough CL, Katon WJ. A longitudinal investigation of posttraumatic stress and depressive symptoms over the course of the year following medical-surgical intensive care unit admission. General hospital psychiatry. 2013;35(3):226-32.
12. Davydow DS, Zatzick D, Hough CL, Katon WJ. In-hospital acute stress symptoms are associated with impairment in cognition 1 year after intensive care unit admission. Annals of the American Thoracic Society. 2013;10(5):450-7.
13. Ratzer M, Romano E, Elklit A. Posttraumatic Stress Disorder in Patients Following Intensive Care Unit Treatment: A Review of Studies Regarding Prevalence and Risk Factors. Trauma & Treatment. 2014;190(3).
14. Davydow DS, Gifford JM, Desai SV, Bienvenu OJ, Needham DM. Depression in general intensive care unit survivors: a systematic review. Intensive care medicine. 2009;35(5):796-809.
15. Bienvenu OJ, Colantuoni E, Mendez-Tellez PA, Dinglas VD, Shanholtz C, Husain N, et al. Depressive symptoms and impaired physical function after acute lung injury: a 2-year longitudinal study. American journal of respiratory and critical care medicine. 2012;185(5):517-24.
16. Ballenger JC, Davidson JR, Lecrubier Y, Nutt DJ, Foa EB, Kessler RC, et al. Consensus statement on posttraumatic stress disorder from the International Consensus Group on Depression and Anxiety. The Journal of clinical psychiatry. 2000;61 Suppl 5:60-6.
17. Boscarino JA. A prospective study of PTSD and early-age heart disease mortality among Vietnam veterans: implications for surveillance and prevention. Psychosomatic medicine. 2008;70(6):668-76.
18. Dedert EA, Calhoun PS, Watkins LL, Sherwood A, Beckham JC. Posttraumatic stress disorder, cardiovascular, and metabolic disease: a review of the evidence. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine. 2010;39(1):61-78.
19. Azoulay E, Pochard F, Kentish-Barnes N, Chevret S, Aboab J, Adrie C, et al. Risk of post-traumatic stress symptoms in family members of intensive care unit patients. American journal of respiratory and critical care medicine. 2005;171(9):987-94.
20. Cuthbertson BH, Rattray J, Campbell MK, Gager M, Roughton S, Smith A, et al. The PRaCTICaL study of nurse led, intensive care follow-up programmes for improving long term outcomes from critical illness: a pragmatic randomised controlled trial. BMJ (Clinical research ed). 2009;339:b3723.
21. Health Do. Comprehensive critical care: a review of adult critical care services. London2000.
22. (NICE) NIfHaCE. NICE clinical guideline 83 – Rehabilitation after acute illness. London: NICE, 2009.
23. (NICE) NIfHaCE. NICE clinical guideline 103 – Delirium: diagnosis, prevention and management. London: NICE, 2010.
24. (NICE) NIfHaCE. NICE clinical guideline 138 – Patient experience in adult NHS services: improving the experience of care for people using adult NHS services. London: NICE, 2012.
25. Strom T, Martinussen T, Toft P. A protocol of no sedation for critically ill patients receiving mechanical ventilation: a randomised trial. Lancet. 2010;375(9713):475-80.

26. Treggiari MM, Romand JA, Yanez ND, Deem SA, Goldberg J, Hudson L, et al. Randomized trial of light versus deep sedation on mental health after critical illness. Critical care medicine. 2009;37(9):2527-34.
27. Hatch R, McKechnie S, Griffiths J. Psychological intervention to prevent ICU-related PTSD: who, when and for how long? Critical care (London, England). 2011;15(2):141.
28. Jones C, Backman C, Capuzzo M, Egerod I, Flaatten H, Granja C, et al. Intensive care diaries reduce new onset post traumatic stress disorder following critical illness: a randomised, controlled trial. Critical care (London, England). 2010;14(5):R168.
29. Peris A, Bonizzoli M, Iozzelli D, Migliaccio ML, Zagli G, Bacchereti A, et al. Early intra-intensive care unit psychological intervention promotes recovery from post traumatic stress disorders, anxiety and depression symptoms in critically ill patients. Critical care (London, England). 2011;15(1):R41.
30. Aitken LM, Rattray J, Hull A, Kenardy JA, Le Brocque R, Ullman AJ. The use of diaries in psychological recovery from intensive care. Critical care (London, England). 2013;17(6):253.
31. Ely EW, Inouye SK, Bernard GR, Gordon S, Francis J, May L, et al. Delirium in mechanically ventilated patients: validity and reliability of the confusion assessment method for the intensive care unit (CAM-ICU). Jama. 2001;286(21):2703-10.
32. Wade D, Howell D, Hankins M, al. e. Development of a new questionnaire to assess psychological stress in intensive care American journal of respiratory and critical care medicine. 2012;185:A2292.
33. Jones C, Skirrow P, Griffiths RD, Humphris GH, Ingleby S, Eddleston J, et al. Rehabilitation after critical illness: a randomized, controlled trial. Critical care medicine. 2003;31(10):2456-61.
34. Tyrer P, Cooper S, Salkovskis P, Tyrer H, Crawford M, Byford S, et al. Clinical and cost-effectiveness of cognitive behaviour therapy for health anxiety in medical patients: a multicentre randomised controlled trial. Lancet. 2014;383(9913):219-25.
35. Gould RA, Mueser KT, Bolton E, Mays V, Goff D. Cognitive therapy for psychosis in schizophrenia: an effect size analysis. Schizophrenia research. 2001;48(2-3):335-42.
36. Rector NA, Beck AT. Cognitive behavioral therapy for schizophrenia: an empirical review. The Journal of nervous and mental disease. 2001;189(5):278-87.
37. Pfammatter M, Junghan UM, Brenner HD. Efficacy of psychological therapy in schizophrenia: conclusions from meta-analyses. Schizophrenia bulletin. 2006;32 Suppl 1:S64-80.
38. Wykes T, Steel C, Everitt B, Tarrier N. Cognitive behavior therapy for schizophrenia: effect sizes, clinical models, and methodological rigor. Schizophrenia bulletin. 2008;34(3):523-37.
39. Jauhar S, McKenna PJ, Radua J, Fung E, Salvador R, Laws KR. Cognitive-behavioural therapy for the symptoms of schizophrenia: systematic review and meta-analysis with examination of potential bias. The British journal of psychiatry : the journal of mental science. 2014;204(1):20-9.
40. Zimmermann G, Favrod J, Trieu VH, Pomini V. The effect of cognitive behavioral treatment on the positive symptoms of schizophrenia spectrum disorders: a meta-analysis. Schizophrenia research. 2005;77(1):1-9.
41. Erickson DH. Cognitive-behaviour therapy for medication-resistant positive symptoms in early psychosis: a case series. Early intervention in psychiatry. 2010;4(3):251-6.
42. Bernard M, Jackson C, Jones C. Written emotional disclosure following first-episode psychosis: effects on symptoms of post-traumatic stress disorder. The British journal of clinical psychology / the British Psychological Society. 2006;45(Pt 3):403-15.
43. Freeman D. Improving cognitive treatments for delusions. Schizophrenia research. 2011;132(2-3):135-9.
44. Turkington D, Kingdon D, Turner T. Effectiveness of a brief cognitive-behavioural therapy intervention in the treatment of schizophrenia. The British journal of psychiatry : the journal of mental science. 2002;180:523-7.
45. McCann E, Bowers L. Training in cognitive behavioural interventions on acute psychiatric inpatient wards. Journal of psychiatric and mental health nursing. 2005;12(2):215-22.
46. Turkington D, Kingdon D, Rathod S, Hammond K, Pelton J, Mehta R. Outcomes of an effectiveness trial of cognitive-behavioural intervention by mental health nurses in schizophrenia. The British journal of psychiatry : the journal of mental science. 2006;189:36-40.
47. Mueser KT, Rosenberg SD, Xie H, Jankowski MK, Bolton EE, Lu W, et al. A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. Journal of consulting and clinical psychology. 2008;76(2):259-71.
48. Jackson C, Trower P, Reid I, Smith J, Hall M, Townend M, et al. Improving psychological adjustment following a first episode of psychosis: a randomised controlled trial of cognitive therapy to reduce post psychotic trauma symptoms. Behaviour research and therapy. 2009;47(6):454-62.
49. (NICE) NIfHaCE. Post-traumatic stress disorder (PTSD) December 2013. . In: NICE, editor. Evidence Update 49 ed. London2013.
50. Sessler CN, Gosnell MS, Grap MJ, Brophy GM, O'Neal PV, Keane KA, et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care unit patients. American journal of respiratory and critical care medicine. 2002;166(10):1338-44.
51. Wade DM, Hankins M, Smyth DA, Rhone EE, Mythen MG, Howell DC, et al. Detecting acute distress and risk of future psychological morbidity in critically ill patients: validation of the intensive care psychological assessment tool. Critical care (London, England). 2014;18(5):519.

53. Foa EB, Cashman L, Jaycox L, al e. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. . Psychological Assessment. 1997;9:445-51.
54. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-70.
55. Ehring T, Kleim B, Clark DM, Foa EB, Ehlers A. Screening for posttraumatic stress disorder: what combination of symptoms predicts best? The Journal of nervous and mental disease. 2007;195(12):1004-12.
56. Hussey MA, Hughes JP. Design and analysis of stepped wedge cluster randomized trials. Contemporary clinical trials. 2007;28(2):182-91.
57. Hayes RJ, Bennett S. Simple sample size calculation for cluster-randomized trials. International journal of epidemiology. 1999;28(2):319-26.
58. Brewin CR, Fuchkan N, Huntley Z, Robertson M, Thompson M, Scragg P, et al. Outreach and screening following the 2005 London bombings: usage and outcomes. Psychological medicine. 2010;40(12):2049-57.
59. Maracy M, Dunn G. Estimating dose-response effects in psychological treatment trials: the role of instrumental variables. Statistical methods in medical research. 2011;20(3):191-215.
60. Oakley A, Strange V, Bonell C, Allen E, Stephenson J. Process evaluation in randomised controlled trials of complex interventions. BMJ (Clinical research ed). 2006;332(7538):413-6.
61. Emsley R, Dunn G, White IR. Mediation and moderation of treatment effects in randomised controlled trials of complex interventions. Statistical methods in medical research. 2010;19(3):237-70.
62. Curtis L. Unit costs of health & social care 2011. : . Canterbury, UK: Personal Service Research Unit, University of Kent; 2011.
63. Health Do. NHS reference costs 2010-11. London: Department of Health, 2011.
64. Grieve R, Nixon R, Thompson SG. Bayesian hierarchical models for cost-effectiveness analyses that use data from cluster randomized trials. Medical decision making : an international journal of the Society for Medical Decision Making. 2010;30(2):163-75.
65. Wright JC, Plenderleith L, Ridley SA. Long-term survival following intensive care: subgroup analysis and comparison with the general population. Anaesthesia. 2003;58(7):637-42.
66. Green C, Dinnes J, Takeda AL, Cuthbertson BH. Evaluation of the cost-effectiveness of drotrecogin alfa (activated) for the treatment of severe sepsis in the United Kingdom. International journal of technology assessment in health care. 2006;22(1):90-100.
67. Latimer NR. Survival Analysis for Economic Evaluations Alongside Clinical Trials—Extrapolation with Patient-Level Data: Inconsistencies, Limitations, and a Practical Guide. Medical Decision Making. 2013.
68. A proposed charter for clinical trial data monitoring committees: helping them to do their job well. Lancet. 2005;365(9460):711-22.69. Zou G. 2004. A Modified Poisson Regression Approach to Prospective Studies with Binary Data. *American Jour Epid.*159(7): 702-706.

## Appendix A: Protocol version history

| **Protocol:** | | **Amendments:** | | |
|---|---|---|---|---|
| **Version no.** | **Date** | **Amendment no.** | **Protocol Section (no./title)** | **Summary of main changes from previous version.** |
| v1.0 | 20 April 2015 | N/A | N/A | N/A |
| v2.0 | 25 January 2016 | Substantial amendment 1 | 9<br>11<br>12 | Revision of patient follow-up questionnaires<br>Revision of the sample size<br>Addition of a GP reporting form |
| N/A | 24 November 2016 | Non-substantial amendment 2 | 1.1<br>3.2<br>5.1<br>7<br>7.1<br>8.1 | Increased recruitment period from 15 months to 17 months |
| v2.1 | 2 January 2017 | Substantial amendment 2 | 11 | Inclusion of final review of assumptions in pre-trial power calculation |

## Appendix B: Intensive care Psychological Assessment Tool (IPAT)

©University College Hospitals, London NHS Foundation Trust

I would like to ask you some questions about your stay in intensive care, and how you've been feeling in yourself. These feelings can be an important part of your recovery. To answer, please circle the answer that is closest to how you feel, or answer in any way you are able to, e.g. by speaking or pointing.

| | **Since you've been in the intensive care unit:** | **A** | **B** | **C** |
|---|---|---|---|---|
| **1** | Has it been hard to communicate? | No | Yes, a bit | Yes, a lot |
| **2** | Has it been difficult to sleep? | No | Yes, a bit | Yes, a lot |
| **3** | Have you been feeling tense? | No | Yes, a bit | Yes, a lot |
| **4** | Have you been feeling sad? | No | Yes, a bit | Yes, a lot |
| **5** | Have you been feeling panicky? | No | Yes, a bit | Yes, a lot |
| **6** | Have you been feeling hopeless? | No | Yes, a bit | Yes, a lot |
| **7** | Have you felt disorientated (not quite sure where you are)? | No | Yes, a bit | Yes, a lot |
| **8** | Have you had hallucinations (seen or heard things you suspect were not really there)? | No | Yes, a bit | Yes, a lot |
| **9** | Have you felt that people were *deliberately* trying to harm or hurt you? | No | Yes, a bit | Yes, a lot |
| **10** | Do upsetting memories of intensive care keep coming into your mind? | No | Yes, a bit | Yes, a lot |

**Do you have any comments to add in relation to any of the answers?**

_____

_____

SCORING

Any answer in column A = 0 points

Any answer in column B = 1 point

Any answer in column C = 2 points

Sum up the scores of each item for a total IPAT score out of 20

Cut-off point ≥7 - indicates patient at risk

## Appendix C: State-Trait Anxiety Inventory (STAI)

Please read the words below and after each one, circle the answer that is closest to how you have been feeling in the past few days.

| **During the past few days I have been feeling…** | | | | | |
|---|---|---|---|---|---|
| **1** | **Calm** | Not at all | Somewhat | Moderately | Very much |
| **2** | **Tense** | Not at all | Somewhat | Moderately | Very much |
| **3** | **Upset** | Not at all | Somewhat | Moderately | Very much |
| **4** | **Relaxed** | Not at all | Somewhat | Moderately | Very much |
| **5** | **Content** | Not at all | Somewhat | Moderately | Very much |
| **6** | **Worried** | Not at all | Somewhat | Moderately | Very much |

## Appendix D: Patient Emotional Reactions Questionnaire (PSS-SR)

These questions are about reactions people may have after intensive care.

Please circle how often a problem has bothered you **in the past month**.

**1.** Have you had upsetting thoughts or images about intensive care that came into your head when you didn't want them to?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**2.** Have you had bad dreams or nightmares about intensive care?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**3.** Have you relived your time in intensive care, acting or feeling as if it were happening again?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**4.** Have you felt emotionally upset when you were reminded of your time in intensive care (e.g. feeling scared, angry, sad, guilty)?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**5**. Have you had physical reactions when you remember your time in intensive care (e.g. breaking into a sweat, heart beating fast?)

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**6.** Have you tried not to think about, talk about, or have feelings about your time in intensive care?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**7.** Have you tried to avoid activities, people or places that remind you of your time in intensive care?

| | | | |
|---|---|---|---|
| **Not at all** | **Once per week or less** | **2 – 4 times per week** | **5 or more times per week** |

**8.** Have you found that you were not able to remember an important part of your time in intensive care?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**9.** Have you had much less interest in important activities?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**10.** Have you felt distant or cut off from people around you?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**11.** Have you felt emotionally numb (unable to cry or have loving feelings?)

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**12.** Have you felt as if your future plans or hopes would not come true?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**13.** Have you had trouble falling or staying asleep?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**14.** Have you felt irritable or had fits of anger?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**15**. Have you had trouble concentrating (e.g. forgetting what you read, losing track of a story on television)?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**16.** Have you been too alert (for example, checking to see who is around you, not being comfortable with your back to a door)?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

**17.** Have you been jumpy or easily startled (for example, when someone walks up behind you)?

| Not at all | Once per week or less | 2 – 4 times per week | 5 or more times per week |
|---|---|---|---|

If you reported any problems in your answers to questions 1-17, then please answer the following questions:

The next two questions are about the timing of emotional reactions people may have after intensive care.

Please circle the answer that is closest to your experience.

**18.** How long have you experienced these problems?

| Not at all | Less than 1 month | 1 to 3 months | More than 3 months |
|---|---|---|---|

**19.** If you reported any problems in your answers to questions 1-17, how long after leaving Intensive care did these problems begin?

| I have not had these type of problems | Less than 1 month | 1 to 3 months | More than 3 months |
|---|---|---|---|

***In the past month have the above problems:***

**20.** Affected your relationships or social life?

| Not at all | A little Bit | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|

**21.** Affected your work or ability to work?

| Not at all | A little Bit | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|

**22.** Affected any other important part of your life such as parenting, or school or college work, or other important activities?

| Not at all | A little Bit | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|

## Appendix E: Patient Mood Questionnaire (HADS)

How are you **CURRENTLY** feeling?
Please circle one answer for each item.

**1.** I feel tense or wound up

| | | | |
|---|---|---|---|
| Most of the time | A lot of the time | From time to time, occasionally | Not at all |

**2.** I still enjoy the things I used to enjoy

| | | | |
|---|---|---|---|
| Definitely as much | Not quite so much | Only a little | Hardly at all |

**3.** I get a sort of frightened feeling as if something awful is about to happen

| | | | |
|---|---|---|---|
| Very definitely and quite badly | Yes, but not too badly | A little, but it doesn't worry me | Not at all |

**4.** I can laugh and see the funny side of things

| | | | |
|---|---|---|---|
| As much as I always could | Not quite so much now | Definitely not so much now | Not at all |

**5.** Worrying thoughts go through my mind

| | | | |
|---|---|---|---|
| A great deal of time | A lot of the time | From time to time, but not often | Only occasionally |

**6.** I feel cheerful

| | | | |
|---|---|---|---|
| Not at all | Not often | Sometimes | Most of the time |

**7.** I can sit at ease and feel relaxed

| | | | |
|---|---|---|---|
| Definitely | Usually | Not often | Not at all |

**8.** I feel if I am slowed down

| | | | |
|---|---|---|---|
| Nearly all the time | Very often | Sometimes | Most of the time |

**9.** I get a sort of frightened feeling like 'butterflies' in the stomach

| | | | |
|---|---|---|---|
| Not at all | Occasionally | Quite often | Very often |

**10.** I have lost interest in my appearance

| | | | |
|---|---|---|---|
| Definitely | I don't take as much care as I should | I may not take quite as much care | I take just as much care as ever |

**11.** I feel restless as I have to be on the move

| | | | |
|---|---|---|---|
| Very much indeed | Quite a lot | Not very much | Not at all |

**12.** I look forward with enjoyment to things

| | | | |
|---|---|---|---|
| As much as I ever did | Rather less than I used to | Definitely less than I used to | Hardly at all |

**13.** I get sudden feelings of panic

| | | | |
|---|---|---|---|
| Very often indeed | Quite often | Not very often | Not at all |

**14.** I can enjoy a good book or radio or tv program

| | | | |
|---|---|---|---|
| Often | Sometimes | Not often | Very seldom |

# Appendix F: Patient Health Questionnaire (EuroQoL - EQ-5D-5L)

Under each heading, please tick the ONE box that best describes your health TODAY

**MOBILITY**

I have no problems in walking about ❑

I have slight problems in walking about ❑

I have moderate problems in walking about ❑

I have severe problems in walking about ❑

I am unable to walk about ❑

**SELF-CARE**

I have no problems washing or dressing myself ❑

I have slight problems washing or dressing myself ❑

I have moderate problems washing or dressing myself ❑

I have severe problems washing or dressing myself ❑

I am unable to wash or dress myself ❑

**USUAL ACTIVITIES** *(e.g. work, study, housework, family or leisure activities)*

I have no problems doing my usual activities ❑

I have slight problems doing my usual activities ❑

I have moderate problems doing my usual activities ❑

I have severe problems doing my usual activities ❑

I am unable to do my usual activities ❑

**PAIN / DISCOMFORT**

I have no pain or discomfort ❑

I have slight pain or discomfort ❑

I have moderate pain or discomfort ❑

I have severe pain or discomfort ❑

I have extreme pain or discomfort ❑

**ANXIETY / DEPRESSION**

I am not anxious or depressed ❑

I am slightly anxious or depressed ❑

I am moderately anxious or depressed ❑

I am severely anxious or depressed ❑

I am extremely anxious or depressed ❑

We would like to know how good or bad your health is **TODAY**.

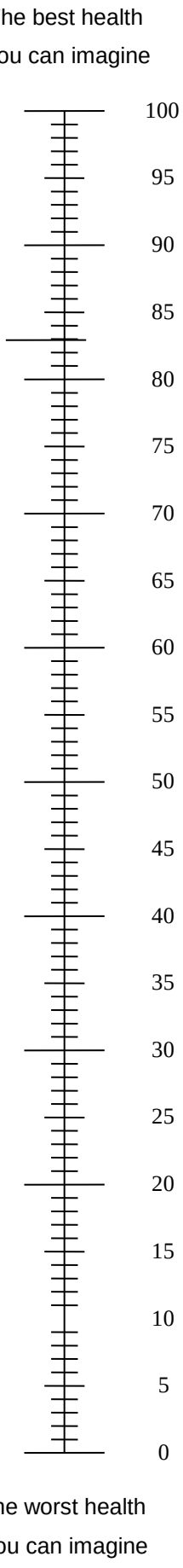
This scale is numbered from 0 to 100.

100 means the **best** health you can imagine.
0 means the **worst** health you can imagine.

Mark an **X** on the scale to indicate how your health is **TODAY**.

Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY = ☐



## Appendix G: Health Services Questionnaire

# Health services

These questions will help us understand the care you needed after leaving the hospital.

Please answer the multiple choice questions by putting a ✓ in **ONE** box for each question.

### Q1 Where are you now?

- ◯ At home (your own home, or a relative's home)
- ◯ In residential care (e.g. nursing home, hospice)
- ◯ In short-term rehabilitation
- ◯ In long-term rehabilitation
- ◯ In hospital
- ◯ Other (please specify): _____

### Q2 Hospital stays

Since you left hospital on
have you stayed overnight in hospital for any reason?

- ◯ **No** – *Please go to Q3*
- ◯ **Yes** – *Please give details about the number of stays below*

For EACH TIME you stayed in hospital please answer the following:

| | Number of nights | | 1 – 3 nights | 4 – 10 nights | 11 or more nights | Did you spend any part of your stay in intensive care? |
|---|---|---|---|---|---|---|
| **1st stay** | ☐ | *Or tick...* | ◯ | ◯ | ◯ | ◯ |
| **2nd stay** | ☐ | *Or tick...* | ◯ | ◯ | ◯ | ◯ |
| **3rd stay** | ☐ | *Or tick...* | ◯ | ◯ | ◯ | ◯ |
| **4th stay*** | ☐ | *Or tick...* | ◯ | ◯ | ◯ | ◯ |

**If you have stayed in hospital more than 4 times, please could you provide information on these further hospital stays in Q7 of the questionnaire.*

## Q3 Visits to hospital outpatients

Outpatient visits are when a patient comes to the hospital to see a specialist (e.g. consultant) but does not stay overnight.

Since you left hospital on
have you visited hospital outpatients about ANY ASPECT of your health?

- ◯ **No** – *Please go to Q4*
- ◯ **Yes** – *Please give details about the number of outpatients visit(s) below*

| Number of visits | | 1 – 3 visits | 4 – 10 visits | 11 or more visits |
|---|---|---|---|---|
| ☐ | *Or tick...* | ◯ | ◯ | ◯ |

## Q4 Visits to health care providers

Since you left the hospital on
have you visited any of the health care providers listed below about ANY ASPECT of your health?

- ◯ **No** – *Please go to Q5*
- ◯ **Yes** – *Please give details about the number of visits below*

For EACH PROVIDER please answer the following:

| Did you visit this provider? | (please tick) | Number of visits | | 1 – 3 visits | 4 – 10 visits | 11 or more visits |
|---|---|---|---|---|---|---|
| GP | ◯ | ☐ | *Or tick...* | ◯ | ◯ | ◯ |
| Nurse at your GP clinic | ◯ | ☐ | *Or tick...* | ◯ | ◯ | ◯ |
| Nurse at hospital or elsewhere | ◯ | ☐ | *Or tick...* | ◯ | ◯ | ◯ |
| Health visitor | ◯ | ☐ | *Or tick...* | ◯ | ◯ | ◯ |
| Critical care follow-up clinic | ◯ | ☐ | *Or tick...* | ◯ | ◯ | ◯ |

# Health services

## Q5 Visits to your home by health care providers

Since you left hospital on
have you had home visits from any of the following health care providers about ANY ASPECT of your health?

○ **No** – *Please go to Q6*

○ **Yes** – *Please give details about the number of visits below*

For EACH PROVIDER please answer the following:

| Were you visited at home by this provider? | (please tick) | Number of visits | | 1 – 3 visits | 4 – 10 visits | 11 or more visits |
|---|---|---|---|---|---|---|
| GP | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Nurse from your GP clinic | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Health visitor or district nurse | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |

## Q6 Visits to other service providers

Since you left hospital on
have had contact (either visits to the provider or home visits) with any of the following service providers about ANY ASPECT of your health?

○ **No** – *Please go to Q7*

○ **Yes** – *Please give details about the number of visits below*

For EACH PROVIDER please answer the following:

| Have you had contact with any of these providers? | (please tick) | Number of visits | | 1 – 3 visits | 4 – 10 visits | 11 or more visits |
|---|---|---|---|---|---|---|
| Occupational therapist | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Speech and Language therapist | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Physiotherapist | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Psychiatrist | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Psychiatric nurse | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Psychologist | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |
| Counsellor | ○ | ☐ | *Or tick...* | ○ | ○ | ○ |

# Health services

Q7 Other services not listed so far

Since you left hospital on
have you had further hospital stays or used any any other health care services for ANY ASPECT of your health that you haven't included previously?

○ **No** – *Please go to Q8*

○ **Yes** – *Please give details about the number of visits below*

For EACH PROVIDER please answer the following:

| Type of service provider | Number of visits | Reason |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Q8 Your views are important to us. Please feel free to provide any other comments you have in the box below.

**Thank you for your time**