



C3-Cloud

“A Federated Collaborative Care Cure Cloud Architecture for Addressing the Needs of Multi-morbidity and Managing Poly-pharmacy”

PRIORITY Objective H2020-PHC-25-2015 - Advanced ICT systems and services for integrated care

D9.4 User Training Materials and Preparation Outcomes

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EXECUTIVE SUMMARY

The overall aim of Deliverable 9.4 is to present the preparation for the C3-Cloud exploratory trial of the 3 pilot sites. This deliverable shows the C3-Cloud training phase within the process of deployment and operation, as planned and performed in each site, to make them fully operational. It illustrates the preparation and execution of the training activities, addressing the users of the C3-Cloud pilot application. The document also reports some issues identified during the preparation phase and status of implementation. The work, shown in D9.4, has been accomplished by means of collaborations of pilot sites and technical partners. This deliverable has had the broader contributions from all beneficiaries of the C3-Cloud consortium.

The document explains the comprehensive training strategy and plan for the C3-Cloud application, including the methodology followed. An overall training plan, covering all high level training items, has been designed for the project. It is based on the innovative C3-Cloud solutions, developed in WPs 5, 6 and 7, and locally integrated and deployed in WP8. Following the general plan, each pilot site has adapted it to its local variation. The global and local training approaches are provided. For each site, it is explained how C3-Cloud stakeholders are introduced into the intervention, how they are supervised and trained, what kinds of training material are provided, what ongoing support measures are in place, and what the current status of the development of the training plan is. Besides, more detailed information about the training materials, developed *ad hoc* for the C3-Cloud intervention, is given.

A set of training materials to guide the application/component and usability studies reported in D9.3 is also included in this deliverable. These materials have been designed and produced collaboratively between Task 9.4 partners. They contain the basic information that the application testing interviewees need to know to answer the questionnaire and documents how users will access and use C3-Cloud system.

The document also describes the texts of the warning messages that will be displayed on the C3-Cloud platforms. They have been agreed by the three pilot sites. Their aim is to remind end users that the C3-Cloud system is part of a research study, which is in the testing phase.

Finally, the lessons learned during the preparation phase and some recommendations, following the project, are presented.

TABLE OF CONTENTS

Executive Summary	3
Table of Contents	4
List of Figures.....	6
List of Tables	6
1. Introduction.....	7
1.1. Purpose.....	7
1.2. Context.....	7
1.3. Approach and Scope	8
1.4. Abbreviations and Acronyms.....	8
2. Methodology	9
2.1. Stakeholder Groups.....	9
2.2. Training Areas/Topics.....	9
2.3. Training Levels and Intensity	11
2.4. Timeline	11
3. Training Plan.....	13
3.1. Training plan proposal	13
3.2. Training materials and tools.....	17
3.3. Timeline	25
3.4. Current status of pilot sites training plans.....	26
4. Warning messages in C3-Cloud System.....	27
5. Training materials for application and usability testing	28
6. Dependant tasks and activities	29
7. Conclusions	30
Appendices.....	31
Appendix 1 - Training Strategy & Plan.....	32
Appendix 2 – SWFT Local materials	45
Appendix 3 - RJH Local materials	66
Appendix 4 - BC Local materials	72
Appendix 5 - Wallet card.....	93
Appendix 6 - C3-Cloud Project Guide Book for Patients and carers	96
Appendix 7 - C3-Cloud Project Guide Book for Healthcare professionals.....	113
Appendix 8 - User manual for the C3-Cloud System for Patients and Carers (PEP).....	136
Appendix 9 - User Manual for the C3-Cloud System for Health Professionals (C3DP)	158
Appendix 10 - Online video tutorials	228
Appendix 11 - User Manual of PEP for Pilot Site Coordinator (PEP Administrator guide).....	230

Appendix 12 - User Manual of C3DP for Pilot Site Coordinator (C3DP Administrator guide)	252
Appendix 13 - C3-Cloud Patient Empowerment Platform (PEP) Technical User Manual	274
Appendix 14 - C3-Cloud Technical Interoperability Suite (TIS) Technical User Manual.....	276
Appendix 15 - C3-Cloud Semantic Interoperability Suite (SIS) Technical User Manual.....	285
Appendix 16 - C3-Cloud Security and Privacy Suite (SPS) Technical User Manual	289
Appendix 17 - C3-Cloud FHIR Repository Technical User Manual	306
Appendix 18 - C3-Cloud Clinical Decision Support (CDS) component Technical User Manual .	329
Appendix 19 - C3-Cloud Coordinated Care and Cure Delivery Platform (C3DP) Technical User Manual	332
Appendix 20 - Training Plan Overview.....	344

LIST OF FIGURES

List of figures, excluding those in appendices.

Figure 1. Main topics covered by the training

Figure 2. Main elements of the training plan

Figure 3. Help button in account menu in C3DP

Figure 4. Download User Guide in C3DP

Figure 5. Info section in PEP

LIST OF TABLES

List of tables, excluding those in appendices

Table 1. Training requirements per participant and per topic

Table 2. Summary of the training proposal plan

Table 3. Local materials/tools per pilot site

Table 4. Common materials/tools

1. INTRODUCTION

1.1. Purpose

The purpose of this deliverable is to report on the operational plans for pilot training and gather the training materials and tools developed with that aim prior to pilot application in 3 sites. The sites are South Warwickshire (SWFT) in UK, Region Jämtland Härjedal (RJH) in Sweden and Basque Country (BC) in Spain. The document gives an overview of how pilot sites train all stakeholders involved in the C3-Cloud intervention (end- and support- users), in order to successfully deliver C3-Cloud at the 3 sites. The document describes also the ways that pilot site partners have introduced end-users (Patients and Carers and Healthcare Professionals) to the intervention and details the training plan for each stakeholder.

This deliverable is one of the key documents in preparing the pilot sites for the operation of the C3-Cloud pilot intervention.

1.2. Context

Work Package 9 is responsible for the evaluation of the C3-Cloud components, pilot application evaluation and impact assessment. This is a complex enterprise involving clinical, technical and organizational aspects. One of the key aspects is the organization of user training workshops prior to and at the beginning of pilot application validation developed in Task 9.4. The scope of this task is the preparation of the exploratory trial before the operation of C3-Cloud Pilot Application, including all stakeholder groups participating in the intervention. The task started in September 2017 (Month 17) and will span for the remaining period of the trial (till January 2020, Month 45).

A revised timeline for the study start and conduct has been agreed by the consortium, taking into account the finalization of some remaining technical and integration issues and the recruitment progress. The study will start in late April - early May 2019 (M36-M37). The updated study timeframe does not impede planning and execution of baseline evaluation (interim results for questionnaires), as planned in DoA. These questionnaires will be completed after training (Apr-May), then data collected will be analysed by June for inclusion in the D9.5. Therefore, the timeline of the training activities has been updated accordingly, taking into account that most of them should take place as close to the start of study as possible. By Month 36 of the project (April 2019), training materials have been completed and the training is ongoing for the users of C3-Cloud system. Currently Task 9.4 is focused on the performance of the local training plans in each site as planned.

All issues dealt with in this document are aligned with WP4 on organisational models, WPs 5-7 on ICT specifications, WP8 on technical specifications and WP9 on evaluation framework. In particular, several tasks (T9.1. *Testing and Evaluation Protocol*, T8.2 *Design of C3-Cloud Pilot application* and T8.3. *Deployment and Operation of C3-Cloud Pilot Application*) have provided important outputs to T9.4. On the other hand T9.4, has provided the user manual containing the basic information to hand out to experts and end-users for the application/component and usability studies in the framework of T9.2. *Component Testing and Usability Studies*. In addition, T9.4 has also supported and will support the development of T9.3. *Pilot Application Evaluation*, Task 4.1 *Exploration of New Patient Pathways and Corresponding Care Plans*, Task 4.3 *Change Management for New Ways of Care Delivery* and Task 9.6 *Pilot Study Oversight: Preparation and Conduct*. Furthermore, two outputs (leaflet and wallet card) developed in T5.1 *Development of self-management training materials for increasing Patient adherence to care plans* have been finalized in T9.4, as shown in this document.

1.3. Approach and Scope

C3-Cloud is an e-health based ICT system, offering integrated, patient-centred care, considering all aspects of multi-morbidity and creating a collaborative environment, for all involved stakeholders. The applicability of this C3-Cloud integrated care approach will be demonstrated by piloting in three European regions (South Warwickshire, Region Jämtland Härjedalen and Basque Country) with quite different health and social care systems, and ICT landscapes. The stakeholder groups of the sites involved in the project have to be trained to participate in the intervention. By training we mean all activities that will help to prepare participants for their involvement in the study, including informing, supporting, up-skilling and coaching related activities. The training has to ensure that key stakeholders have sufficient knowledge, confidence and practical understanding of both the study and the C3-Cloud system to participate in, or to support, the study effectively. The training not only has to maximize participant confidence and involvement but also be as realistic as possible, as it would be during a real life implementation.

In this deliverable, an overview of the work, carried out within Task 9.4, on how the pilot sites train staff and patients, in order to successfully deliver C3-Cloud application at the local sites, is shown. The training plans of the sites and the materials and tools developed for the C3-Cloud project are summarized. In addition, the document gives an overview on the current status of the trial sites training plans, materials and tools.

1.4. Abbreviations and Acronyms

Abbreviation / Acronym	Definition
BC	Basque Country (pilot site)
C3DP	Coordinated Care and Cure Delivery Platform
CDS	Clinical Decision Support
DoA	Description of Action
GDPR	General Data Protection Regulation
HCP	Healthcare Professional
MDT	Multi-Disciplinary Team
PEP	Patient Empowerment Platform
RJH	Region Jämtland Härjedalen (pilot site)
SIS	Semantic Interoperability Suite
SPS	Security and Privacy Suite
SWFT	South Warwickshire NHS Foundation Trust (pilot site)
TIS	Technical Interoperability Suite
UI	User Interface

2. METHODOLOGY

This section describes the analyses of training needs, in terms of the stakeholders who need to be trained, the training areas/topics to be covered, the levels of the training and the timeline.

2.1. Stakeholder Groups

Training will need to be provided to the stakeholder groups, which include end users of the system, those that will support the end users and those that will support the system.

- End-users:
 - Intervention patients will use the system;
 - Informal carers will support intervention patients with system use;
 - Healthcare professionals (HCPs) who are members of the multidisciplinary team (MDT) will treat intervention patients using system).
- Support users:
 - Local Project Team/Local “Super users” identified from C3-Cloud project team and local healthcare professionals will provide training and support to end users;
 - Local Technical Team/System administrators will install, maintain and support the system.

A Super User is a “more advanced” Healthcare professional who is able to do the training for their own staff. They will be healthcare professionals in the 3 sites.

2.2. Training Areas/Topics

The training provided has covered the following 4 main topics:

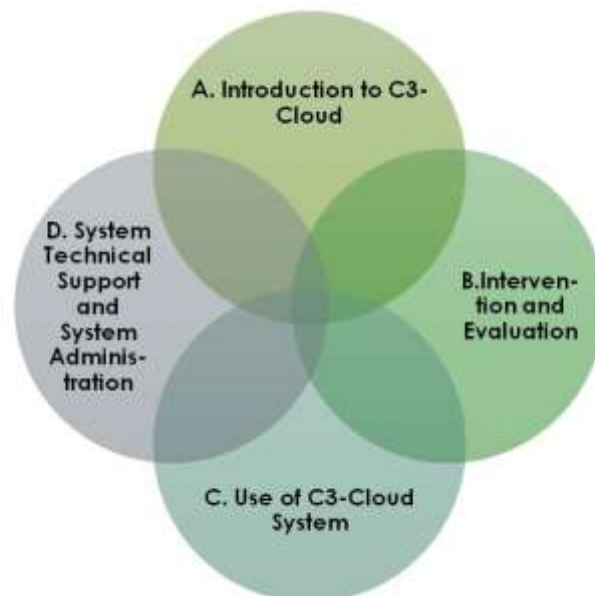


Figure 1. Main topics covered by the training

2.2.1. Introduction to C3-Cloud

This topic provides an overview of the C3-Cloud study itself, including the background, purpose of and principles of the project and the key innovative solutions:

- Problems addressed by the study: chronicity, multimorbidity and poly-pharmacy;
- C3-Cloud principles:
 - Personalized Care Plans;
 - Patient centre care;
 - Self-management, Patient Empowerment and education;
 - Coordinated and collaborative MDT;
 - Shared decision making.
- Key innovative solutions:
 - C3DP: Healthcare professionals, members of the MDT;
 - PEP: Patients and informal carers and MDT members.

2.2.2. Intervention and Evaluation

This topic outlines the project intervention and the evaluation, describing their design, timeline and main stakeholders involved. It covers also the collection and protection of data and explains the patient GDPR rights:

- Project description;
 - Description of project intervention:
 - Care plan activities;
 - Empowerment activities;
 - Evaluation (including questionnaires).
 - Study design;
 - Study Setting;
 - Study duration;
 - Timeline for evaluation.
- Data use, processing, storage and protection.

2.2.3. Use of System (C3DP and PEP components)

End users of the system, and those involved in delivering training or with supporting end users, need to be trained in how to navigate through the system and how to use the functionality provided. This needs to be tailored to the respective stakeholder group and to the system components that they will be using, i.e., C3DP or PEP, as follows:

Patients and Informal Carers (PEP)

- System overview including how PEP links to C3DP;
- Getting an account and logging in including security and privacy considerations;
- Viewing and navigating through a record;
- Care Plan management and feedback;
- Data entry, e.g. uploading readings and photos;
- Use of training materials;
- Use of communication mechanisms, e.g., messaging;
- Reporting a problem and getting help.

Healthcare Professionals (C3DP)

Same topics as above, plus:

- Clinical decision support mechanisms;
- Basic understanding of the PEP system so that they can help patients.

Project Team/Super Users

- All of the above for C3DP and PEP to enable them to provide training and support to end users

2.2.4. System Technical Support and System Administration

This topic provides technical guidance for local support teams and configuration instructions:

- Understanding the system architecture (technical manuals of C3-Cloud components);
- What support the local technical teams will need to provide;
- Basic trouble shooting;
- Who to contact in the event of a problem.

2.3. Training Levels and Intensity

The content of each training topics need to be tailored for the target audience training. Information needs to be presented more simply for some than others. Thus, varying levels of detail/simplicity and training intensity has been required.

Table 1. Training requirements per participant and per topic

USERS	INTRODUCTION	INTERVENTION/ EVALUATION	USE OF C3-Cloud SYSTEM	TECHNICAL AND ADMINISTRATIVE SUPPORT
Healthcare professionals (MDT members)	×	×	×	
Patients and carers (intervention group)	×	×	×	
Local project teams		×	×	×
Local technical team/ System administrators	×		×	×

2.4. Timeline

2.4.1. Preparatory Training

The most intense phase of the training will take place before the start of the study to ensure that all participants are well prepared. The training for new participants in the intervention will be delivered in the same way; e.g., if a Healthcare professionals replaced or a new project team members joins the project.

2.4.2. Refresher Training

Additional *ad hoc* support needs to be made available to study participants and support teams prior to, and during, the study. This will be particularly important in the early stages of the study. This support includes self-directed study materials and Help Desk and local project contacts available in the 3 sites.

3. TRAINING PLAN

The training plan has been developed to deliver training and support to all stakeholder groups. The goal has been to ensure that all of them receive particularly pertinent training. The approach of the training has aimed to be as pragmatic as possible, minimising the time required for trainers and trainees and the production/use of materials, tools and facilities. Self-directed learning and tools have been encouraged.

3.1. Training plan proposal

The training plan has been defined according to each stakeholder group as shown in section 2.1. A number of training activities have been organised for each of stakeholder. Each activity has been described in more detail with regard to the information provided, the materials and tools used, the participants responsible for it (trainers), and the date and facility/place of the event.

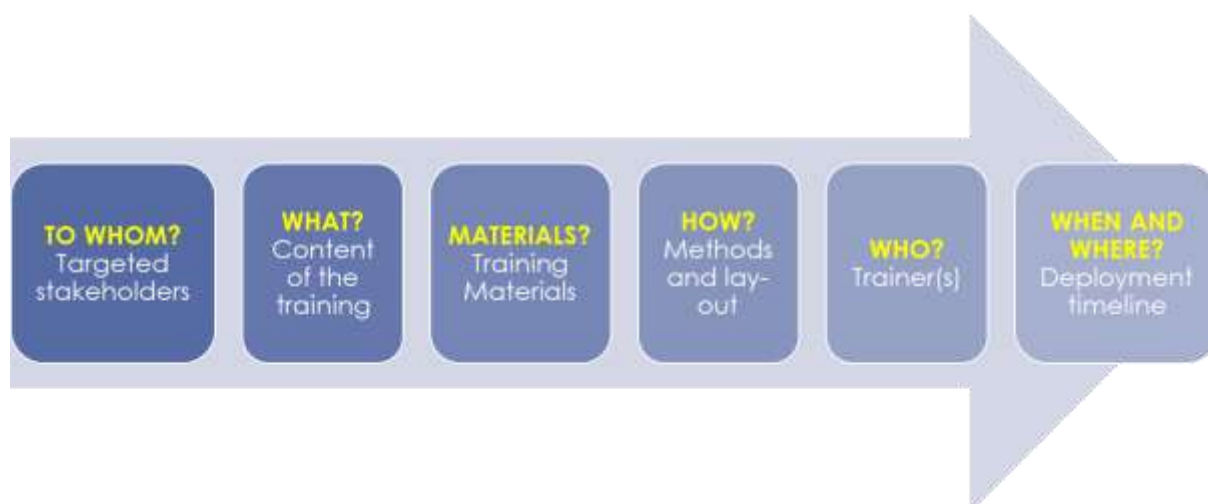


Figure 2. Main elements of the training plan

Table 2 shows the plan of activities/events of the training proposal, the information provided, the materials/tools required and the schedule. The referenced materials are outlined in section 3.2.

The three sites have developed their own local training plan based in the common one, adapting it to its localities and requirements. Organizational, structural and cultural differences have been taken into account. However, the pilot sites' plans do not show noticeable differences among them. The changes come mostly at the place where the training activity is delivered and the stakeholders involved. The plans have been modified during the project as they are live documents. Further information of the current 3 sites training delivery plans can be seen at Appendix 1.

Table 2. Summary of the training proposal plan for the sites

STAKEHOLDER GROUP	TRAINING ACTIVITY/EVENT	TRAINING/INFORMATION	MATERIALS/TOOLS <i>(numbers in brackets relates to materials in Appendixes)</i>	TIMEFRAME
Intervention Patients and Informal Carers	Recruitment	High level information about the project to request patient participation. <i>If required: More detailed discussion between Patient and Project Team /MDT member about the project and whether they wish to, or are eligible to, participate</i>	Local materials (2, 3, 4)	
	High level training	Overview of the study and system	Local materials (2, 3, 4)	After consent to participate but as close to the start of the study as possible
		PEP System Demonstration	On-line PEP demo	
		Handouts and Takeaway Materials	Project Guide Book for Patients and Carers (6) User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) C3-Cloud video link (10) Wallet card (5) On-line Video tutorial (PEP chapter) (10)	
	System training, user patient level	Self-directed learning on how to use the PEP system and its functions	On-line Video tutorial (PEP chapter) (10)	After the session above and as close to start of study as possible and after the fully version of C3-Cloud

STAKEHOLDER GROUP	TRAINING ACTIVITY/EVENT	TRAINING/INFORMATION	MATERIALS/TOOLS <i>(numbers in brackets relates to materials in Appendixes)</i>	TIMEFRAME
			User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8)	application is completed deployed in the pilot sites
Healthcare professionals (MDT members)	Recruitment	High level information about the project to request Patient participation.	Local materials (2 for SWFT; 3 for RJH and 4 for BC)	
	High level training	Overview of the study and system	Local material (2 for SWFT; 3 for RJH and 4 for BC) Access to test C3DP and PEP systems with meaningful dummy data	After consent to participate but as close to the start of the study as possible but as close to the start of the study as possible
	System	Formal training on how to use the system	Access to test C3DP and PEP systems with meaningful dummy data	After the session above and as close to start of study as possible
		Self-directed learning on how to use the C3DP and PEP systems	On-line video tutorial (C3DP and PEP chapters) (10) Project Guide Book for HCPs (7) User Manuals for the C3-Cloud system (C3DP) for HCPs (9) User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8)	After the formal training above and after the fully version of C3-Cloud application is completed deployed in the pilot sites

STAKEHOLDER GROUP	TRAINING ACTIVITY/EVENT	TRAINING/INFORMATION	MATERIALS/TOOLS <i>(numbers in brackets relates to materials in Appendixes)</i>	TIMEFRAME
Local Project team/ Local “Super users”	Super User Training, proficiency level	Training on how to use PEP and C3DP which will allow trainees to train others	Access to test system with meaningful dummy data User manual of PEP for pilot site coordinator (11) User manual of C3DP for pilot site coordinator (12)	Before starting training sessions for users to be able to train others
	Evaluation Training	Evaluation activities: Timeline and process of the	Evaluation Webinar	As soon as the study begins
Local Technical Teams / System administrators	System Support Training and Architecture Familiarisation	Walkthrough with the technical teams and discussion of the support process	Technical Webinar Technical User Manuals (13-19)	Once the final version of the system has been installed and tested at the pilot sites.
	System Administration Training	Training on how to administer the system and undertake the necessary configurations	Technical User Manuals (13-19)	Once the final version of the system has been installed and tested at the pilot site and prior to the commencement of the configuration work

3.2. Training materials and tools

Based on the plan above, a core set of training materials and tools have been designed and developed tailoring the target audience and aiming for simplicity. A close and intense collaboration among the task partners, including technical and sites partners, has allowed producing valuable resources.

These materials include presentations and videos introducing the intervention; wallet cards providing basic information and local contacts; leaflets and guide books for local administrators and study personnel; user manuals and online videos for participants and stakeholders; and technical manuals for local IT teams. The materials have been grouped as local specific (to be used specifically for each pilot site) and common (common to the three sites).

3.2.1. Local materials

These are materials that are specific to, and/or developed by, each site to support local training activities. The local materials have been prepared in the local languages of the 3 sites. Table 3 shows the local materials that have been included as appendixes below.

In addition to the materials listed below, each site has included as part of the initial recruitment pack, the “Computer Skills Check” to test if the Patient or Informal Carer has sufficient ICT literacy to participate. The ICT Handling Self-Check can be seen in Deliverable D10.4, Annex 8.3.

SWFT

- **Covering Letter** from the participating GP Practice aims to introduce the project and outline the request for participation of the potential Patients and Informal Carers. It is included in the initial recruitment pack.
- **Information Leaflet for Patients & Helpers** gives potential patients an understanding of the project to help them to decide whether to participate. It is included in the initial recruitment pack.
- **Summary of Evaluation Activities for Participants.** Each end user (patients/carers and HCPs) receives a list of questionnaires/evaluation activities that they will be involved with during the study. It is included in the initial recruitment pack.
- **Recruitment Crib Sheet.** This crib sheet is used by the project team when telephoning patients to discuss the study further (after receiving their consent to contact form). The purpose of the sheet is to ensure that consistent messages are given to each patient and that the same topics are covered.
- **Information Sheet for Healthcare Professionals** gives healthcare professionals a high level understanding of the project to help them to decide whether to participate. It is used during the Healthcare professional recruitment process.
- **C3-CLOUD Introductory Training Session Presentation.** This consists of a set of slides which will be used during a training session that takes place once patients have signed their informed consent. Patients (and their carers, where appropriate) will meet with a member of the project team immediately prior to their initial care plan preparation meeting with one of the participating GPs. The presentation provides them with information about the project and the evaluation, plus any important warnings. This will be followed up with a demonstration of the system.

SWFT local materials can be seen at Appendix 2.

RJH

- **Patient and Carer Information Sheet** gives potential patients an understanding of the project to help them to decide whether to participate. It is included in the initial recruitment pack.
- **Information Sheet for Healthcare Professionals** gives healthcare professionals a high level understanding of the project to help them to decide whether to participate. It is used during Healthcare professional recruitment process.
- **Workshop Invitation Letter** to invite the intervention group patients to the introductory workshop
- **C3-CLOUD Workshop Presentation** consists of a set of slides which will be used during a training session that takes place once Patients have signed their informed consent. The presentation provides them with information about the project and the evaluation, plus any important warnings. This will be followed up with a demonstration of the system.

RJH local materials can be seen at Appendix 3.

BC

- **Covering Letter from Practice** informs the eligible patients that they are going to be contacted by phone to be invited to be part of the C3-Cloud intervention. The letter is mailed by primary care professionals to their eligible patients. Mailing is optional. If desired, the professional may contact the patient directly by telephone.
- **Patient Information Sheet** gives potential patients an understanding of the project to help them to decide whether to participate. It is included in the initial recruitment pack.
- **Information Sheet for Healthcare Professionals** gives healthcare professionals a high level understanding of the project to help them to decide whether to participate. It is used during Healthcare professional recruitment process.
- **C3-CLOUD Workshop Presentation.** The induction workshop takes place once participants have consented to participate in the intervention. The workshop presentation provides information about the project, its concepts, interventions, use of the system & evaluation.

BC local materials can be seen at Appendix 4.

Table 3. Local materials/tools per pilot site

PILOT SITE	LOCAL MATERIAL	Appendix
SWFT	Covering Letter	Appendix 2
	Information Leaflet for Patients & Helpers	Appendix 2
	C3-CLOUD Introductory Training Session Presentation	Appendix 2
RJH	Patient and Carer Information Sheet	Appendix 3
	Workshop Invitation Letter	Appendix 3
BC	Covering letter for eligible patients (optional)	Appendix 4
	Patient Information Sheet	Appendix 4
	C3-CLOUD Workshop Presentation	Appendix 4

3.2.2. Core Materials/tools

A core set of training materials has been designed and developed collaboratively between the project partners to ensure maximum effectiveness, to maintain consistency and to reduce duplication of effort (Table 4). The core materials are aimed at end-users (patients and informal carers, and healthcare professionals) and support users (local project team, super users, local technical teams and local system administrators).

For each common material intended to end-users, an English version has been jointly created for use by all 3 sites. Once it has been approved, the Swedish and Spanish sites have translated these documents into their corresponding languages and have inserted screenshots, if required, in the pertinent language. Once each site has its own version, some minor modifications may be made as deemed appropriate. Appendixes in each following sub sections show the agreed common version of the materials.

Table 4. Common materials/tools

COMMON MATERIALS / TOOLS	TARGETED STAKEHOLDER	APPENDIX
Introductory video	Patients and Carers	NA
Wallet card	Patients and Carers	Appendix 5
Project Guide Books for Patients and Carers	Patients and Carers	Appendix 6
Project Guide Books for HCPs	HCPs	Appendix 7
User manual for the C3-Cloud System for Patients and Carers (PEP)	Patients and Carers and HCPs	Appendix 8
User Manual for the C3-Cloud System for Health Professionals (C3DP)	HCPs	Appendix 9
Online video tutorials	HCPs and Patients and Carers	Appendix 10
User Manual of PEP for Pilot Site Coordinator (PEP Administrator guide)	Local project team (Pilot site Coordinator)	Appendix 11
User Manual of C3DP for Pilot Site Coordinator (C3DP Administrator guide))	Local project team (Pilot site Coordinator)	Appendix 12
C3-Cloud Patient Empowerment Platform (PEP) Technical User Manual	Pilot site technical teams and System administrators	Appendix 13
C3-Cloud Technical Interoperability Suite (TIS) Technical User Manual	Pilot site technical teams and System administrators	Appendix 14
C3-Cloud Semantic Interoperability Suite (SIS) Technical User Manual	Pilot site technical teams and System administrators	Appendix 15
C3-Cloud Security and Privacy Suite (SPS) Technical User Manual	Pilot site technical teams and System administrators	Appendix 16
C3-Cloud FHIR Repository Technical User Manual	Pilot site technical teams and System administrators	Appendix 17
C3-Cloud Clinical Decision Support (CDS) component Technical User Manual	Pilot site technical teams and System administrators	Appendix 18
C3-Cloud Coordinated Care and Cure Delivery Platform (C3DP) Technical User Manual	Pilot site technical teams and System administrators	Appendix 19
Technical webinar	Pilot site technical teams and System administrators	NA
Evaluation webinar	Local project team (Pilot site Coordinator)	NA

- **Introductory Video C3-Cloud**

This introductory video for intervention patients and carers was developed in Task 5.1. The video introduces the impact and complexity of long term disease and multi-morbidity, and the importance of self-management and treatment compliance. Each site has its own video in its language. The 3 videos can be accessed by a private link in YouTube, in order to protect the integrity of the pilot research:

- English version: <https://youtu.be/DE-GbYqXDSc>;
- Spanish version: <https://www.youtube.com/watch?v=V9bTjVQgRoM>;
- Swedish version: <https://youtu.be/f5qqQxYOeBE>.

• **Wallet card**

The wallet card aims to be a quick reminder to the intervention patients about how to access the system and who to contact. It is one of the two outputs developed in Task 5.1 which has been finalized in T9.4. Wallet card contains basic and local details of the project: location details (url) for PEP, private link in C3-Cloud website and contact details for the study in each site have been included. The local version of the 3 sites of the wallet card can be seen at Appendix 5. Currently the pilot sites are in the process of printing the cards for the trial.

• **C3-Cloud Project Guide Books**

The aim of Project Guide Books (PGBs) is to provide a comprehensive reference guide about the project and the intervention. These documents give information about the background and purpose of the C3-Cloud study, design of the study, role of the participants, evaluation and who to contact for help, among others topics. PGBs incorporate the information provided by the leaflet developed previously in Task 5.1. Two documents have been generated, one focused on patients and carers and other on healthcare professionals (as shown at Appendixes 6 and 7, respectively). The format, content and complexity of both documents have been tailored according to the targeted stakeholders. Then pilot site specific changes have been done separately for each site.

• **User manuals for the C3-Cloud system**

User Manual provides comprehensive instructions on how to use the C3-Cloud system. Like with PGBs, two user manuals have also been created, one of which focused on PEP platform, to be used by Patients and carers, whilst the other addresses the C3DP for use by HCPs (Appendixes 9 and 9). They have also been adapted to the target audience according to their requirements. The user manuals are based on the final version of the PEP (as described in D5.2 *Data collection and feedback mechanisms* -D5.3 *Responsive multichannel patient empowerment platform*) and C3DP (as described in D7.3 *Personalized Care Plan Development Platform* – D7.4 *C3-Cloud Coordinated Care and Cure Platform*) components. The manuals include all the functionalities that the stakeholders are going to use during the intervention.

The common documents include the complete flow, as they are the generic manuals for all sites. Then pilot sites have localised the user manuals as required according to the local deployment of C3-Cloud application and their integration with the local systems, as it is described in D8.2 *Design of the implementation of the pilot application scenarios* and D8.3 *Deployment of C3-Cloud applications*. For example, the access procedures to the C3-Cloud platforms are different in the 3 sites. This has led to customizing the user manuals on each site, showing the local procedures.

• **Online video tutorials**

Online video tutorials show the concept of the C3-Cloud system and provide step by step guidance on how to use it. Just like the user manuals, they are walkthroughs highlighting the main features of the system that clinicians and Patients as end-users will need to do.

A storyboard has been developed to record the online video tutorial. The storyboard describes the scenario where the care plan is created, accessed, updated or used during the provision of healthcare. It includes the use of both platforms (C3DP and PEP) by the end-users (Healthcare Professionals and Patients and Informal Carers). The storyboard is organized in 4 main sections: 1) Creating a

personalized patient care plan for the first time (in C3DP); 2) Visualization of the plan by the patient and execution of relevant activities (in PEP); 3) follow-up appointment and review and update of the care plan according to the patient's status and his/her conditions progress (in C3DP) and 4) description of a few functionalities of both platforms (C3DP and PEP) which are not shown previously. The video has been split into in these 4 chapters that can be watched individually. The online video tutorial includes information about the time each chapter starts, in order to facilitate its use by end users of the system and encourage its purpose as a support tool. For each site, a video tutorial will be recorded and texts have been added as descriptions. Current drafts are available in Appendix 10 but will continue to be worked on with related translations for each site.

- **Administrator guides for C3-Cloud System**

The administrator guides are aimed for administrative users of C3-Cloud System and illustrate a complete demonstration of both PEP and C3DP Administration Interface for the management of the system. The C3-Cloud system provides some content management and overall configuration functionalities to be used by the Pilot Site Coordinators or Administrators. Administration interface of both PEP and C3DP enables performing such interventions in a user-friendly manner. Two guides have been produced, one per component as in Appendixes 11 and 12. They include a complete series of all the possible functionalities that a Pilot Site Coordinator is able to perform. The consortium has decided not to translate these latter materials, taking into account the targeted audience and their English skills.

- **Online system demo/training environment**

This tool consists of the online demo versions of the system with dummy data. Its aim is to allow users to enter and view data, and test functions in both platforms (C3DP and PEP) before the intervention starts. They address all the stakeholder groups.

A demo system has been prepared in the development environment, where component developers have made their components accessible at public endpoints. Demo versions of both platforms have been available to all C3-Cloud participants:

- C3DP: <https://app.srdc.com.tr/c3dp/>
- PEP: <https://c3clouddev.medixine.com/>

They have also been available in the deployed system in the staging environment of each site. The staging environment is where the production environment is prepared and then duplicates it in the production. Each local staging environment has shown the UIs of the platforms in the local language. The deployment of C3-Cloud application in the staging environment of the 3 sites carried out in the framework of T8.3 has been crucial for the development and availability of this tool. Further information about the staging environments of the 3 sites can be found in D8.3 "Deployment of C3-Cloud applications".

- **Technical manuals**

The technical manuals provide guidance to pilot site local IT teams on how to use, manage and maintain the system. They address Local Project Teams/Super Users and Technical/System administrators. They illustrate description of the information system, operation, resolution of incidents and application operations for each component. Each C3-Cloud component has each own technical manual: PEP, TIS, SIS, SPS, FHIR REPOSITORY, CDS and C3DP. Their production has required an important involvement of the C3-Cloud component owner partners. The documents have been written in English and provided as word or pdf documents (Appendixes 13-19).

- **Technical webinar**

Technical webinars aim to train in how to support the system. They are intended for support users (Local project teams/Super users, Technical/System administrators). The webinar includes a walkthrough of the system architecture based on the technical manuals with the technical teams and discussion of the support process. Technical partners provide the webinar in each site, once the final version of the system has been installed and tested at the pilot site and prior to the commencement of the configuration work.

- **Evaluation webinar**

The evaluation webinar aims to ensure all relevant partners are aware of the evaluation activities and when they take place and the process that is going to be followed. It addresses the Local Project Teams and Super users. It will be held by empirica, as the partner responsible for the evaluation once the pilot starts. Evaluation questionnaires v2.1 developed in Task 9.3, will be used in this internal consortium webinar. The date will be set up by empirica with each site, according to its local training plan proposal.

3.2.3. Availability of training materials targeting end-users

During the training phase previous to the study, the materials will be available as paper copies and email electronic versions (pdf), according to the local plans. In addition, the core materials targeting end-users (PGBs, User Manuals, link to introductory video, online video tutorials) will be accessible on the project website for the participants via a specific link. The three sites have their local private C3-Cloud website link for Patients and Carers and HCPs. Patients will find their specific private link of C3-Cloud website in their wallet card, to support their participation in the intervention. These links will also be available during the study till its end.

- SWFT
 - <http://c3-cloud.eu/training/swft/Patientsandcarers>
 - <http://c3-cloud.eu/training/swft/healthcareprofessionals>
- Basque Country
 - <http://c3-cloud.eu/formacion/osakidetza/pacientesycuidadores>
 - <http://c3-cloud.eu/formacion/osakidetza/profesionalessanitarios>
- RJH
 - <http://c3-cloud.eu/traning/rjh/Patienterochanhoriga>
 - <http://c3-cloud.eu/traning/rjh/halsovardspersonal>

Moreover, during the intervention, the training materials will be accessed directly from C3DP and PEP. Healthcare professionals will access their training materials from the “Help” menu in the C3DP system. Once HCPs will log into C3D, click on ‘Help’ tab from the top menu and select the material to access. To download it, HCPs will click on the download bottom and the training material will be downloaded to their computer.

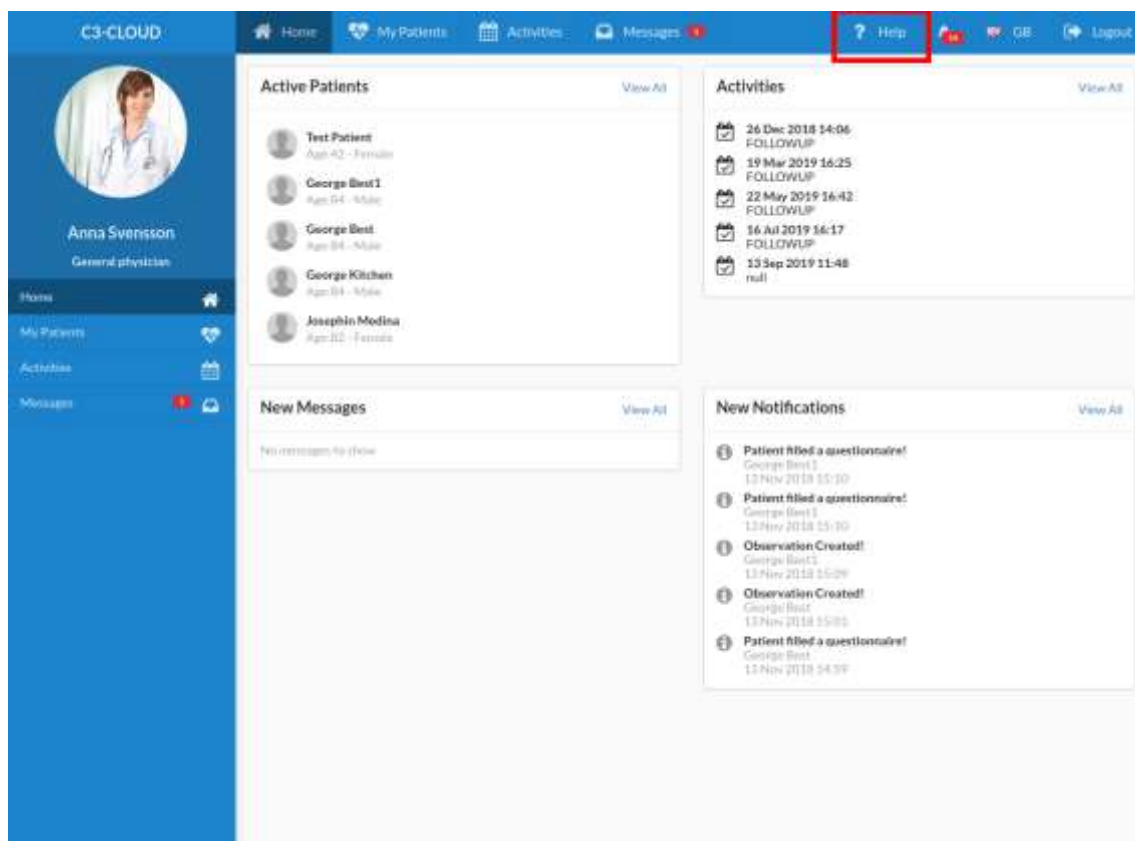


Figure 3. Help button in account menu in C3DP



Figure 4. Download User Guide in C3DP

Similarly, patients will access training materials from PEP. The Info menu section contains information and educational material assigned by the healthcare professionals as well as instructions, training materials and useful links.

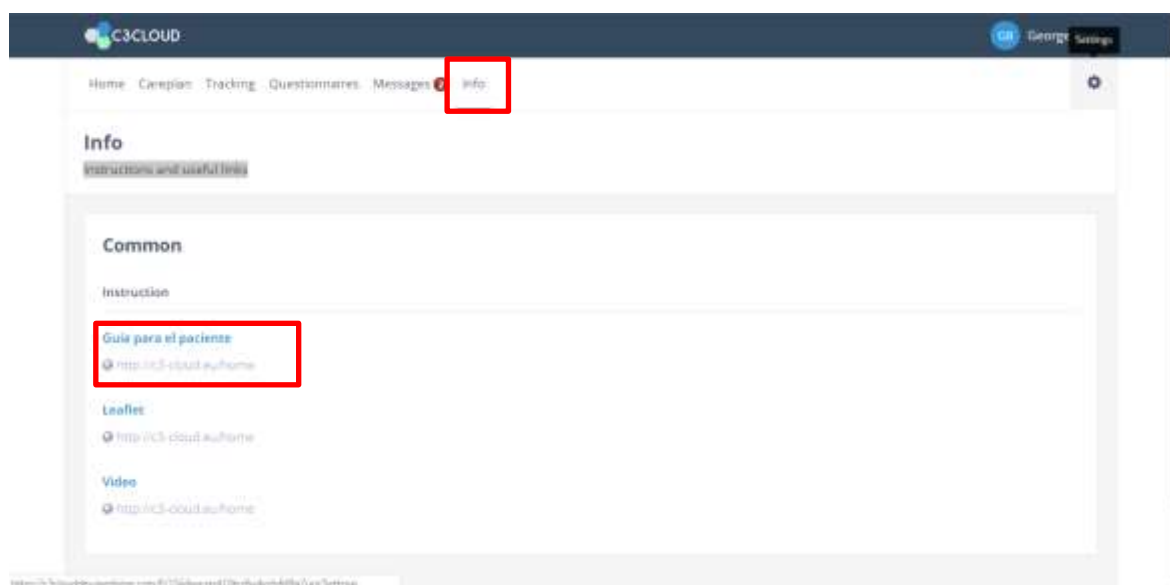


Figure 5. Info section in PEP

On line video tutorials will be also accessible in YouTube private links. Regarding the privacy of the access to the videos, a link will be provided to the participants. In that way, only the patients who are intervention patients, receive the link and can access to it in YouTube or from the C3-Cloud website.

3.3. Timeline

The timescales below show the global timeline, considering the 3 pilot sites. Minor differences can be found in each site according to their local plan.

Activity	Date
Recruit MDT Members	October 18-January 19
Ethical approval in place	June-December 18
System ready, usability studies and final version of materials	April 18
Train Local Project Team	January-April 19
Train MDT Members	April 19
Recruit Patients	October – April 19
Train Intervention Patients and Informal Care Givers	April - May 19
Pilot study starts	End of April – early May 19
Data collection starts	May 19

Training activities continue during pilot operation (M45) in order to support new participants and refresher activities, if required.

3.4. Current status of pilot sites training plans

The pilot study is expected to start Mid May. Currently the pilot sites are very active in the phase of training. The aim is that pilot sites to have completed training of all users by that date. Regarding healthcare professionals, pilot sites have scheduled training sessions with HCPs by Mid-April-early May. With reference to patient training sessions, they are being set by early-mid May. Further information of the 3 sites training delivery plans can be seen at Appendix 20. In relation to the recruitment, the HCP recruitment is completed in the 3 sites while the patient recruitment is finalizing in 2 of the 3 sites (one of the sites has concluded it).

4. WARNING MESSAGES IN C3-CLOUD SYSTEM

The consortium has agreed to include warning messages in both C3-Cloud platforms to remind the participants in the intervention that the C3-Cloud system is part of a research study and it is in the test phase at the moment. Patients are reminded not to rely on it for urgent care related issues or emergency situations. HCPs should always review the provided recommendations according to their clinical criteria. The warning messages will be shown permanently in both platforms. Moreover they will appear in feedback screens in PEP.

The 3 sites have agreed the final texts to be included in the warning messages. Texts are translated into Swedish and Spanish for RJH and BC sites (*italic*).

- SWFT
 - C3DP: “Attention: You are using the C3-Cloud system as part of a research study and you should not rely on the information or guidance within the system for delivering clinical care”.
 - PEP: “Attention: You are using the C3-Cloud system as part of a research study and you should not rely on it for urgent care related issues or emergency situations”
- RJH
 - C3DP: “Attention: You are using the C3-Cloud system as part of a research study and you should not uncritically rely on the data for in the system”. *“OBS! C3-Cloud är en del av ett forskningsprojekt som nu testas. Du skall därför inte okritiskt acceptera givna behandlingsråd”*.
 - PEP: “Attention: You are using the C3-Cloud system as part of a research study and you should not rely on it for urgent care related issues or emergency situations”
- BC:
 - C3DP: "Attention! You are using the C3-Cloud system which is a research project. It is not a substitute for corporate clinical information systems. The recommendations you provide should be reviewed according to your clinical criteria". *"¡Atención! Está utilizando el sistema C3-Cloud que es un proyecto de investigación. No sustituye a los sistemas de información clínica corporativos. Las recomendaciones que proporciona deben ser revisadas de acuerdo a su criterio clínico"*
 - PEP: "Attention: You are using the C3-Cloud system which is a research project. It should not be used for emergency or urgent care situations nor should it replace the usual communication mechanisms with your doctor or nurse. *"¡Atención!: Está utilizando el sistema C3-Cloud que es un proyecto de investigación. No debe utilizarlo para situaciones de atención urgente o de emergencia ni sustituye a los mecanismos de comunicación habitual con su médico o enfermera"*

5. TRAINING MATERIALS FOR APPLICATION AND USABILITY TESTING

Task 9.4 has been an input to the application and usability testing carried out in Task 9.2 *Component Testing and Usability Studies* in May 2018. On one hand, “application testing” evaluates the integration of C3-Cloud components and functional testing of the application as a whole and evaluates if all C3-Cloud components work well together. On the other hand, “usability” assesses usefulness and ease of use for the end users using both “the product reaction cards” method and the QUIS7 questionnaire.

To do so, T9.4 has prepared 2 detailed user manuals (one per C3-Cloud component: PEP and C3DP) explaining each functionality of the component and relevant applications. The manuals have been handed out to C3-Cloud testers to ensure the performers of the component / application testing (technical partners, MDT members MDT and Patients), are able to use the components to the application testing and be used for the heuristic walkthrough (experts, Patients and MDT members Patients).

This evaluation has taken place on M24 (May 2018) so the manuals to be used as training have been developed by that date. The manuals have been generated during the development of the C3-Cloud system, prior to their completion and integration (due by M26). Thus, they have reflected the system as it was at M24, according to the D7.3 *Personalized Care Plan Development Platform* (section 6) and D5.2 *Data collection and feedback mechanisms*.

Close collaboration of T9.2 leader (INSERM) and technical partners has been key developing these training materials. Results of this evaluation have been reported in D9.3. Their results regarding the user manuals have been taken into account to improve further training materials produced in section 3.

6. DEPENDANT TASKS AND ACTIVITIES

There are a number of tasks and activities which impact on the training plan developed in T9.4 which are out of the scope of this Task. Firstly, the 3 sites have to obtain the approval of the intervention by the local Ethical Boards. Information about the ethical applications and their progress can be found in D10.3. Currently the 3 pilot sites have their approval in place.

Secondly, the training materials have to be prepared based on the final versions of the C3-Cloud System. The system has to be finalized and adapted to specific characteristics of each site (available resources, roles, facilities, care practices, etc.). To do so, the components have to be successfully finished (WPs 5-7), tested by means of the fulfillment of the component and application testing and usability studies (T9.2) and integrated, deployed and fully operative in the 3 sites environment (T8.3). The timetable for the finalization of all the C3-Cloud components and their deployment and testing of the C3-Cloud application in the staging environment of the three sites has been critical for T9.4 work plan timeline.

Finally, an intense and close collaboration between local sites and technical partners in the framework of T8.3, has allowed the consortium to work out together and define an agreed, realistic, work plan. This collaboration has enabled not only that all partners can monitor and follow the progress of activities but also be informed of any changes/updates to be able to react as soon as it is required. Thus, final versions of training materials reflect what the participants will find during the intervention as they have been developed onto the final versions of each C3-Cloud component.

7. CONCLUSIONS

Overall the following conclusions are drawn as part of this deliverable:

- A thorough review of the timeline of all activities related with training is required. Sufficient time is required for the preparation of the training materials before the training previous to the start of the study.
- Although all stakeholders receive training on the project and intervention, each stakeholder group requires different levels of detail/simplicity and intensity of training.
- Training materials and tools have to be designed and developed tailoring the target audience. Patients and HCPs will need to have the same understanding of the project and its objectives but it needs to be explained in laymen's terms for the Patients
- Materials which are addressing older population need dot make bigger text and images.
- We expect that the user manuals developed in this task will be used as reference material and not as instruction manuals. That is why they are complete, exhaustive and detailed documents that contain all the functionalities of the components.
- A recommendation beyond the project is to present the manuals in a more pragmatic and action-oriented manner.
- Rest of the materials have been developed with the aim to be as concise, graphic, user-oriented, easy to read, simple and short as possible.
- A close and intense collaborate on among the task partners, including technical and sites partners, has key producing valuable resources.
- Ideally, the training materials would have been tested in terms of readability and easy to read, especially for someone who is not very technically minded. The testers would include at least Patients, HCPs and members of the local team in each site.
- It is relevant to choose the most appropriate trainer / communicator in order to really reach the target audience. The presence of top managers of the organisations involved presenting the project in the first training session supports the HCP engagement.
- All sites have taken into regard a Help Desk provision. The Help Desk has a structure into the pilot sites. This structure enables any questions and issues to be raised and dealt with at the appropriate level, whilst identifying any learning opportunities to be collated quickly, and shared effectively.
- Ongoing supervision of the progress of the training, and its reinforcement if required, is coordinated by Local Project Team members. They are in charge of detecting inefficiencies or improvement areas, solving incidents, coordinating distinct working groups, providing training on different aspects when needed supporting professionals, and monitoring the whole process.

APPENDICES

The following Appendices (separate documents) support this document:

Appendix 1 Training Strategy & Plan

Appendix 2 SWFT Local Materials

Appendix 3 RJH Local Materials

Appendix 4 BC Local Materials

Appendix 5 Wallet Card

Appendix 6 C3-Cloud Project Guide Book for Patients and Carers

Appendix 7 C3-Cloud Project Guide Book for Healthcare Professionals

Appendix 8 User Manual for the C3-Cloud System for Patients and Carers (PEP)

Appendix 9 User Manual for the C3-Cloud System for Health Professionals (C3DP)

Appendix 10 Online Video Tutorials

Appendix 11 User Manual of PEP for Pilot Site Coordinator (PEP Administrator guide)

Appendix 12 User Manual of C3DP for Pilot Site Coordinator (C3DP Administrator guide)

Appendix 13 C3-Cloud Patient Empowerment Platform (PEP) Technical User Manual

Appendix 14 C3-Cloud Technical Interoperability Suite (TIS) Technical User Manual

Appendix 15 C3-Cloud Semantic Interoperability Suite (SIS) Technical User Manual

Appendix 16 C3-Cloud Security and Privacy Suite (SPS) Technical User Manual

Appendix 17 C3-Cloud FHIR Repository Technical User Manual

Appendix 18 C3-Cloud Clinical Decision Support (CDS) component Technical User Manual

Appendix 19 C3-Cloud Coordinated Care and Cure Delivery Platform (C3DP) Technical User Manual

Appendix 20 Training Plan Overview

Appendix 1 - Training Strategy & Plan

1. SWFT

v1.11 (Last updated: 22/04/2019)

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
POTENTIAL PATIENT PARTICIPANTS	Initial Contact during Recruitment process	High level information about the project to request patient participation	<ul style="list-style-type: none"> • Covering Letter from Practice (2) • Information Leaflet for Patients & Helpers (2) • Computer Skills Check • Summary of Evaluation Activities for Patients-Helpers 	Jan 19	When recruitment pack is sent out to potential participants by GP practice	Patient's home	Rother House will send pack using the Docmail service
	Telephone /Email Follow-Up	More detailed discussion between patient & project team member about the project & whether they wish to, or are eligible to, participate	<ul style="list-style-type: none"> • Recruitment Crib sheet 	Jan – Mar 19	On receipt of signed consent to contact form from patient	Over phone/email	Project Team member

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
INTERVENTION GROUP PATIENTS WHEN CONSENTED (plus Helpers/Carers)	1-2-1 training	Overview of the study & system	C3-Cloud Workshop Presentation (2)	May 19		Rother House Medical Centre	With a member of the project team
		PEP System Demonstration	On-line PEP demo				
		Handouts & Takeaway Materials	<ul style="list-style-type: none"> • Project Guide Book – Patients-Helpers (6) • User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) • C3-CLOUD video link • Wallet card (5) • On-line Video tutorial – PEP (10) 				
	System Training	Self-directed learning on how to use the PEP system and its functions	<ul style="list-style-type: none"> • On-line Video tutorial – PEP (10) • User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) 	May 19+	After the 1-2-1 session above & as close to start of study as possible. Before using the system & any time during the study (as scheduled by the patient)	Patients home	Patient - self-directed learning

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
HEALTHCARE PROFESSIONALS	Recruitment Meeting	High level information about the project & system	<ul style="list-style-type: none"> Information Sheet for Healthcare Professionals Information Sheet for Patients-Helpers(2) 	Jan – Apr 19	During initial meeting with healthcare professionals after nomination by their respective healthcare organisation	To suit healthcare professional/within their own organisation	Project Team Member will talk to the healthcare professional in person
	System Training	A member of the project team will sit with the GP to check the care plan once the patients details have been loaded and will deliver 1-2-1 system training.	<ul style="list-style-type: none"> Access to test C3DP & PEP systems with meaningful dummy data 	April-May 19	After consent to participate form has been signed but as close to the start of the study as possible	Rother House Medical Centre	Training provided by a member of the project team
		Formal, direct 1-2-1 training, or small groups, on how to use the system (most likely when the HCPS has scheduled to see a patient)	<ul style="list-style-type: none"> Access to test C3DP & PEP systems with meaningful dummy data 	Apr – May 19	After consent to participate form has been signed	To suit healthcare professional/within their own organisation, e.g. Warwick Hospital, Rother House etc	Project Team Members/Super Users will deliver the training
		Self-directed learning on how to use the C3DP & PEP systems, including training on new ways of working / evaluation. Project processes, e.g. handling withdrawal	<ul style="list-style-type: none"> On-line C3DP video tutorial (10) On-line PEP video tutorial (10) Project Guide Book - HCPs (7) User Manuals for the C3-Cloud system (C3DP) for HCPs (9) User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) 	Apr – May 19+	After the formal training above	To suit healthcare professional	Links will be given out during 1-2-1 training sessions and sent to healthcare professional by the project team by email

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
LOCAL SWFT PROJECT TEAM (inc Super Users)	Super User Training	Training on how to use the final version of PEP & C3DP which will allow super users to cascade training to others	<ul style="list-style-type: none"> Access to test system with meaningful dummy data User manual of PEP for pilot site coordinator (11) User manual of C3DP for pilot site coordinator (12) 	Ongoing		To suit Project Team Member or Super User	Direct training by Project Technical Partners
	Evaluation Training	Internal consortium webex to ensure all relevant partners are aware of what evaluation activities will take place, when & the process that will be followed	<ul style="list-style-type: none"> Evaluation Webex 	May 19		Webex	Empirica to deliver webex

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
PILOT SITE TECHNICAL TEAMS / SYSTEM ADMINS	System Support Training & Architecture Familiarisation	Walkthrough of the system architecture with the technical teams and discussion of the support process	<ul style="list-style-type: none"> Technical Webex Technical User Manual 	Apr-May 19	Once the final version of the system has been installed & tested at the pilot site	Webex	Technical Partners to deliver webex & facilitate ongoing discussion during system installation
	System Administration Training	Training on how to administer the system and undertake the necessary configurations	<ul style="list-style-type: none"> Technical User Manuals (13-19) 	Apr-May 19	Once the final version of the system has been installed & tested at the pilot site and prior to the commencement of the configuration work	Webex? / ongoing discussion during component installation	Technical Partners to deliver webex & facilitate ongoing discussion during system installation

2. RJH

(Last updated: 22/04/2019)

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
POTENTIAL PATIENT PARTICIPANTS	Study information and recruitment by mail where the patient responds and returns an informed consent	High level information about the project & its interventions	<ul style="list-style-type: none"> • Information sheet/letter (3) • ICT Check • Informed consent 	2018	Study information and invitation to participate in August - December 2018.	Post mail	Research nurses with support of a project team member

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)?</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
INTERVENTION GROUP PATIENTS WHEN CONSENTED (plus Helpers/Carers)	High Level training	Overview of the study & system PEP System Demonstration Handouts & Takeaway Materials	<ul style="list-style-type: none"> • C3-Cloud Workshop Presentation • On-line PEP demo • Project Guide Book – Patients-Helpers (6) • User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) • C3-CLOUD video link • Wallet card (5) • On-line Video tutorial – PEP (10) 	May 19	As close to start of study as possible. Before using the system & any time during the study (as scheduled by the patient)	Health centers / remotely	With a member of the project team
	Formal System Training	PEP System Demonstration	<ul style="list-style-type: none"> • On-line Video tutorial – PEP (10) • System User Manual - Patients & Helpers (8) 	May 19	As close to start of study as possible. Before using the system & any time during the study (as scheduled by the patient)	Patients home	Patient - self-directed learning

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
HEALTHCARE PROFESSIONALS	Initial contact / Recruitment	High level information about the project & system	<ul style="list-style-type: none"> Information Sheet for Healthcare Professionals Information Sheet for Patients-Helpers (3) 	2018	During initial meeting with healthcare professionals	To suit healthcare professional/within their own organisation	Research Nurses and Project Team Member
	System Training	Overview of the study and system. Formal training, on how to use the system	<ul style="list-style-type: none"> Access to test C3DP & PEP systems with meaningful dummy data Presentation 	April-May 19	As close to the start of the study as possible	8 Healthcare centres	Training provided by members of the project team
		Self-directed learning on how to use the C3DP & PEP systems, including training on new ways of working / evaluation. Project processes, e.g. handling withdrawal	<ul style="list-style-type: none"> On-line C3DP video tutorial (10) On-line PEP video tutorial (10) Project Guide Book - HCPs (7) User Manuals for the C3-Cloud system (C3DP) for HCPs (9) User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) 	Apr – May 19+	After the formal training above	To suit healthcare professional	Links will be given to healthcare professional by the project team

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
LOCAL PROJECT TEAM (inc Super Users)	Super User Training	Training on how to use the final version of PEP & C3DP which will allow super users to cascade training to others	<ul style="list-style-type: none"> Access to test system with meaningful dummy data User manual of PEP for pilot site coordinator (11) User manual of C3DP for pilot site coordinator (12) 	Ongoing		To suit Project Team Member or Super User	Direct training by Project Technical Partners
	Evaluation Training	Internal consortium webex to ensure all relevant partners are aware of what evaluation activities will take place, when & the process that will be followed	<ul style="list-style-type: none"> Evaluation Webex 	May 19		Webex	Empirica to deliver webex

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
PILOT SITE TECHNICAL TEAMS / SYSTEM ADMINS	System Support Training & Architecture Familiarisation	Walkthrough of the system architecture with the technical teams and discussion of the support process	<ul style="list-style-type: none"> Technical Webex Technical User Manuals (13-19) 	Apr-May 19	Once the final version of the system has been installed & tested at the pilot site	Webex	Technical Partners to deliver webex & facilitate ongoing discussion during system installation
	System Administration Training	Training on how to administer the system and undertake the necessary configurations	<ul style="list-style-type: none"> Technical User Manuals (13-19) 	Apr-May 19	Once the final version of the system has been installed & tested at the pilot site and prior to the commencement of the configuration work	Webex? / ongoing discussion during component installation	Technical Partners to deliver webex & facilitate ongoing discussion during system installation

3. BC

Last updated: 20/04/2019

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
POTENTIAL PATIENT PARTICIPANTS	Initial Contact during Recruitment process	High level information about the project to request patient participation	<ul style="list-style-type: none"> • Covering Letter (optional for HCPs) (4) • Patient Information Sheet (4) • Computer Skills Check • Informed consent 	Ongoing	When the first contact occurs between HCP and the patient	Healthcare center/Phone	Primary care HCPs (GPs and Primary care nurses)
	Telephone /Email Follow-Up (optional)	More detailed discussion between patient & project team member about the project & whether they wish to, or are eligible to, participate		On going		Phone/Healthcare center	Primary care HCPs (GPs and Primary care nurses)

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)?</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
INTERVENTION GROUP PATIENTS WHEN CONSENTED (plus Helpers/Carers)	High Level training	Overview of the study & system PEP System Demonstration Handouts & Takeaway Materials	<ul style="list-style-type: none"> • C3-Cloud Workshop Presentation (4) • On-line PEP demo • Project Guide Book – Patients-Helpers (6) • User Manuals for the C3-Cloud system (PEP) for Patients and Carers (8) • C3-CLOUD video link • Wallet card (5) • On-line Video tutorial – PEP (10) 	May 19	As close to start of study as possible. Before using the system & any time during the study (as scheduled by the patient)	Health centers / remotely	Primary care HCPs supported by members of the local project team
	Formal System Training	PEP System Demonstration	<ul style="list-style-type: none"> • On-line Video tutorial – PEP (10) • System User Manual - Patients & Helpers (8) 	May 19	As close to start of study as possible. Before using the system & any time during the study (as scheduled by the patient)	Patients home	Patient - self-directed learning

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
HEALTHCARE PROFESSIONALS	Initial contact / Recruitment	High level information about the project & system	<ul style="list-style-type: none"> Information Sheet for Healthcare Professionals Information Sheet for Patients-Helpers (4) 	2018-February 19	During initial meeting with healthcare professionals	To suit healthcare professional/within their own organisation	Local Project Team Members
	System Training	Overview of the study and system	<ul style="list-style-type: none"> C3-Cloud introductory presentation (4) Project Guide Book - HCPs (7) C3DP demo 	January - March 19	As close to the start of the study as possible	Healthcare centers	
		Formal training, on how to use the system	<ul style="list-style-type: none"> Access to test C3DP & PEP systems with meaningful dummy data 	May 19	As close to the start of the study as possible and after the overview training above	Healthcare centers	Training provided by members of the project team Training of trainees
		Self-directed learning on how to use the C3DP & PEP systems, including training on new ways of working / evaluation. Project processes, e.g. handling withdrawal	<ul style="list-style-type: none"> On-line C3DP video tutorial (10) On-line PEP video tutorial (10) User Manuals for the C3-Cloud system (C3DP) for HCPs (9) User Manuals for the C3-Cloud system (PEP) for Patients and Carers(8) 	May 19	After the formal training above	To suit healthcare professional	Links will be given to healthcare professional by the project team

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
LOCAL PROJECT TEAM (inc Super Users)	Super User Training	Training on how to use the final version of PEP & C3DP which will allow super users to cascade training to others	<ul style="list-style-type: none"> Access to test system with meaningful dummy data User manual of PEP for pilot site coordinator (11) User manual of C3DP for pilot site coordinator (12) 	Ongoing		To suit Project Team Member or Super User	Direct training by Project Technical Partners
	Evaluation Training	Internal consortium webex to ensure all relevant partners are aware of what evaluation activities will take place, when & the process that will be followed	<ul style="list-style-type: none"> Evaluation Webex 	May 19		Webex	Empirica to deliver webex

Stakeholder Group	Training Event or Activity	What Training/Information will be Provided	What Training Materials/Tools will be Used? <i>(numbers in brackets relates to materials in Appendixes)</i>	Estimated Training Timeframe <i>(Date/Date Range/Timing)</i>		Where will the Training/Information be Delivered?	How, & by whom, will Training/Information be provided?
PILOT SITE TECHNICAL TEAMS / SYSTEM ADMINS	System Support Training & Architecture Familiarisation	Walkthrough of the system architecture with the technical teams and discussion of the support process	<ul style="list-style-type: none"> Technical Webex Technical User Manuals (13-19) 	April-May 19	Once the final version of the system has been installed & tested at the pilot site	Webex	Technical Partners to deliver webex & facilitate ongoing discussion during system installation
	System Administration Training	Training on how to administer the system and undertake the necessary configurations	<ul style="list-style-type: none"> Technical User Manuals (13-19) 	April-May 19	Once the final version of the system has been installed & tested at the pilot site and prior to the commencement of the configuration work	Webex? / ongoing discussion during component installation	Technical Partners to deliver webex & facilitate ongoing discussion during system installation

Appendix 2 – SWFT Local materials

1. Covering Letter

Dr Timothy G A Crook BM MRCGP DCH DRCOG DIMC RCS.Ed
Dr Cristina P Ramos MB BCh DRCOG MRCGP
Dr Lucy Blunt MRCGP DFRH DRCOG MBChB
Dr Samir Khan MBChB MRCGP
Dr Emma Smethurst MRCGP DRCOG MBChB BSc
Dr Zoe Bee BSc MBChB MRCP DCH DRCOG MRCGP
Dr Stephen McGulgan BSc MBChB MRCGP
Mr Tom Ganner RGN DPSN ENB100 ENB998

ROTHER HOUSE MEDICAL CENTRE
ALCESTER ROAD
STRATFORD UPON AVON
WARWICKSHIRE
CV37 6PP

Tel: 01789 269386
Fax: 01789 298742

Private & Confidential

<<Full Name>>
<<Address>>

Dear <<Full Name>>

I am writing to let you know that this practice is participating in a research study called *C3-CLOUD* looking at improving the care and treatment of patients aged 55 and over with multiple long term illnesses.

We believe that you may be suitable candidate for this study and would therefore like to invite you to participate.

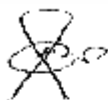
We would be very grateful if you would take the time to read the Information Leaflet and other supporting information that is included with this letter which explains more about the study. The leaflet also includes details of who to contact if you have any questions or require further information about the study before making a decision.

If you are happy to be contacted by a member of the project team to discuss the study further you are kindly requested to complete the attached 'Patient Consent to Contact' form and return it as soon as possible to the project team at the South Warwickshire NHS Foundation Trust in the pre-paid envelope provided.

On receipt of your form a member of the project team will contact you by the method that you have stated on the form.

Please turn over the page

Covering Letter for Patients v1.2 – 12-11-18



Sincerely

Dr Cristina Ramos, Partner GP

Documents Enclosed:-

- Patient Information Sheet (Leaflet)
- Summary of Evaluation Activities for Patients
- Computer Skills Check
- Patient Consent to Contact Form
- Pre-paid Response Envelope

Covering Letter for Patients v1.2 – 12-11-18

2. Information Leaflet for Patients & Helpers



A Federated Collaborative Care Cure Cloud Architecture for Addressing the Needs of Multi-morbidity and Managing Poly-pharmacy (grant agreement No. 689181)

IRAS Project ID: 224635

Who has Reviewed the Study?

The North of Scotland (2) Research Ethics Committee has reviewed the study.

Information Sheet for Patients & Helpers v1.4 (12-11-18)

Page 1 of 8

What is the C3-CLOUD Study?

'C3-CLOUD' is a healthcare computer system which has been developed as part of a study which is funded by the European Commission.

The C3-Cloud system is designed so that patients can work more closely with their doctors, nurses and other healthcare professionals, allowing them to be more actively involved in their care and treatment.

The study will specifically look at whether this new computer system can help to improve the care of patients aged 55 & over with more than one of the following long-term illnesses - diabetes type 2, mild to moderate heart failure, moderate renal (kidney) failure or mild to moderate depression.

Why are we asking you to participate in the study?

We want to test how useful and user friendly this new computer system is with both patients and healthcare professionals for 12 months between February 2019 and January 2020.

As you are a patient at the Medical Centre that is taking part in this study (Rother House), and you have at least two of the four illnesses listed above, we would like to invite you to take part in the study and help trial the C3-CLOUD system with us.

We would ask you to consider the information in this leaflet before making a decision. Please note that your participation in the study is completely voluntary and requires your written consent. You can also withdraw from the study at any time.

What does it mean to take part in the study?

If you agree to take part you will be asked to use the new C3-CLOUD system during the 12-month study and you (or a helper) will need to use an internet-connected device from time to time.

You will be invited to come and see a GP at the Rother House Medical Centre after you have consented to join the study, where you will agree (or re-confirm) your care plan with them, and this will be entered into the system. This might include setting some goals and activities for you. It might also involve offering you some of the educational information that is available in the system to help you understand your condition or treatment more. This first visit is likely to be longer than a normal consultation, so please allow at least half an hour.

Once your care plan is prepared, you will be given access to the patient part of the C3-Cloud system (the Patient Empowerment Platform) so that you can view and provide updates on your care plan whenever you wish. You will also be able to send messages and updates to your care team members via the system. Each time you visit your doctor or nurse, your care plan in the C3-Cloud system will be reviewed with you. It is not expected that you will need to make additional visits for the purpose of the study unless this is felt necessary by your healthcare professional.

You will be trained on how to use the system before the start of the study. This will include an introductory workshop which is likely to be held at Stratford Hospital and will take about 2 hours. You will also have access to a simple video tutorial and written training materials.

Some computer skills are necessary. If you decide to take part, a member of the project team will assess your computer skills with you using the enclosed Computer Skills Check. However, if you think you do not have the necessary skills but would still like to take part, you may nominate a 'helper' such as friend, family member or carer who can view and enter information for you. You would need to provide your permission for them to access your record and may cancel their access at any time if you change your mind. The nominated helper will also be asked to provide their consent to take part, especially as they will be asked to complete 2 questionnaires.

During the study, you will be asked to provide us with some feedback on your experience with the system using 3 questionnaires. In addition, 50 patients will be selected at random to complete 6 additional questionnaires. Details about this can be found in the attached 'Summary of Evaluation Activities' document but it will all be explained to you at the introductory workshop.

After the study period, the system will stop being used to be improved using the experience and feedback that we have gained. We hope, but cannot guarantee, that the system will be available for use in the future.

Information about your health and care will be collected from your health care records at South Warwickshire NHS Foundation Trust and the Rother House Medical Centre. Please see the 'Protecting Your Information' section further on in this leaflet for how we use and protect your information.

More detailed information about how to prepare for, and take part in, the study will be provided to you at a later stage.

Are there any risks involved?

There are no health risks anticipated and there will be no new medicines or treatments being tested.

Are there any benefits to participating in the study?

By agreeing to participate in the study you are contributing to the progression of research that may lead to more effective care for patients like yourself.

We hope that the use of the system during the study will give you a unique opportunity to become better informed about your health problems and for greater participation in your care planning. The new functions of the system offer you, and the health professionals treating you, easier ways of sharing information.

Withdrawing from the study

If you decide to withdraw from the C3-CLOUD study, you can do so at any time without providing a reason. The treatment you receive if you leave the study will be as good as the standard treatment you would normally receive.

If you wish to withdraw from the study, please inform the local study contact named on the back page of this leaflet, who will ask if you would be willing to complete an optional withdrawal form. We will also ask you on the form to tell us what you would like us to do with any information that has already been collected about or from you, i.e. whether or not we can continue to use it for the research study.

Once you have withdrawn from the study, we will not contact you further and all access to your record in the C3-Cloud system will be removed.

What do you need to do to participate in the study?

If you are interested in taking part, we would kindly ask you to complete and sign the enclosed 'Patient Consent to Contact Form' and return it in the pre-paid envelope provided. We will not contact you unless you give us your permission.

On receipt of your form a member of the project team will contact you to discuss the study further with you and answer any questions that you may have. They will also go through the enclosed Computer Skills Check with you.

If after discussing the study with a member of the team, you decide that you would like to take part, a Consent to Participate Form will be sent to you which you will need to sign and return.

Please note that by agreeing to participate in the study, you would be taking part in research.

Protecting your Information

South Warwickshire NHS Foundation Trust is the sponsor for this study based in the United Kingdom. We will be using information from you and from your medical records in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we may keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting the Data Protection Officers (DPOs) below:-

- Data Protection Officer,
South Warwickshire NHS Foundation Trust
dpo.swft@nhs.net
01926 495321
- Tom Ganner, Practice Manager, Rother House Medical Centre
Tom.Ganner@rothermc.nhs.uk
01789 269386

How will your information be used?

Once your consent is obtained, project staff at South Warwickshire NHS Trust will use your name, NHS number and contact details to contact you about the research study, and to make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study.

Individuals from South Warwickshire NHS Foundation Trust, Rother House Medical Centre and regulatory organisations may look at your medical and research records to check the accuracy of the research study, to audit the data collection process and to organise study activities.

Staff at South Warwickshire NHS Trust and Rother House Medical Centre will collect information about you for this research study from your healthcare records, from any questionnaires that you are asked to complete, and from any information that you enter into the C3-Cloud system.

This information will include your name, NHS number, other identifiers from your healthcare records, contact details and health information, which is regarded as a special category of information. We will use this information to care for you during the study and to analyse the effects of the C3-Cloud system.

Identifiable information that is collected about you in the C3 Cloud system will be accessible to health professionals from South Warwickshire NHS Trust and the Rother House Medical Centre who are involved in the study, but your record will only be accessed by those that are directly involved in your care.

The local project team, and staff who are responsible for fixing bugs in the system, may also need to access your information in the system from time to time.

The researchers who will analyse your information will not be able to identify you and will not be able to find out your name, NHS number, any other identifiers or your contact details. You will not be identified in any publications resulting from the study.

Anyone who has access to your information as part of the study will have signed confidential agreements.

Our legal basis for processing your personal data

For processing to be lawful under the General Data Protection Regulations (GDPR), as data controller we are obliged to identify a lawful basis before we can process your personal data. As such Article 6(1) (a) applies where the data subject has given consent to the processing of his or her personal data for one or more specific purposes and Article 9(1)(a) (a) the data subject has given explicit consent to the processing of those personal data for one or more specified purposes, except where Union or Member State law provide that the prohibition referred to in paragraph 1 may not be lifted by the data subject.

How long will your information be kept for?

South Warwickshire NHS Foundation Trust will keep identifiable information about you from this study for at least 8 years after the study has finished in April 2020 in line with Records Management Code of Practice for Health and Social Care 2016. A copy of your C3-Cloud record may also be attached to your normal healthcare records at Rother House Medical Centre at the end of the study.

Non-identifiable information collected from you, or about you, will be stored securely by Warwick University for upto 10 years to support future research.

Future Research

When you agree to take part in a research study, the information about your health and care may be provided to researchers running other research studies in this organisation and in other organisations. These organisations may be universities, NHS organisations or companies involved in health and care research in this country or abroad. Your information will only be used by organisations and researchers to conduct research in accordance with the UK Policy Framework for Health and Social Care Research.

This information will not identify you and will not be combined with other information in a way that could identify you. The information will only be used for the purpose of health and care research, and cannot be used to contact you or to affect your care. It will not be used to make decisions about future services available to you, such as insurance.

Complaints Procedure

If you wish to raise a complaint about how we have handled your personal data, you can contact the Data Protection Officers named earlier in this leaflet who will investigate the matter. You can also contact the local study contact below.

If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO).

Your local study contact:

The organization below is formally responsible for the study in your area. The person below is able to answer questions about the study and your participation.

Contact Name	Marie Beach, IT Project Manager
Organisation Name	South Warwickshire NHS Trust
Organisation Address	Lakin Road, Warwick, CV34 5BW
Tel No	01926 495321 x 3085 or 07921 682022
Email	marie.beach@swft.nhs.uk

3. C3-Cloud Introductory Training Session Presentation

C3-Cloud Study

Introductory Training Session Slides

v1.2 15-03-19

Purpose of this Session

- To thank you for taking part
- To introduce you to the team
- To prepare you for the trial
- To show you the system
- To provide you with access to some of the materials you will need
- To give you an opportunity to ask questions

Background to the Study

- Difficulties with managing more than 1 long term illness
- Challenges of managing complex information across multiple services – not joined up
- The C3-Cloud system has been developed to:-
 - bring information together in one place
 - Encourage patients to work more closely with their healthcare professionals & jointly manage their care through shared care plans
 - Empower patients to engage more actively in ‘self-management’ practices

Aim of the Trial

To see if C3-Cloud helps with better managing your conditions and if the system is acceptable to you and your health care professionals

What are we asking you to do?

1. To use the C3-Cloud System to as part of your routine care during the trial (May 19 – Jan 20)
2. To provide us with feedback on your experience with using the system
3. To allow us to use your information to assess the effectiveness & usefulness of the system

1. Use the C3-Cloud System as part of your routine care

What is the C3-Cloud System?

- Records details about you, your illnesses & your care plan
- There are 2 parts to the C3-Cloud system:-
 - C3DP system - used by healthcare professionals
 - PEP system - used by patients
 - Information is shared between the 2 systems
- The system will be used by yourself & your healthcare professional to develop & manage a shared care plan

How do I access the C3-Cloud System?

You will need:-

- A device, e.g. computer, laptop, tablet etc
- Access to the internet
- Suitable internet browser, e.g. Chrome or Firefox.
NB: Internet Explorer does not work
- A link to the system, e.g. save it to 'favourites'
- A login for the C3-Cloud system
- Help from a friend/carer etc (if needed)

What Will I Need to Do?

- PEP system demonstration
 - Carry out & provide feedback on Goals & Activities
 - Complete health related Questionnaires & Upload readings
 - Read Training materials
 - User the messaging system
- Not all functions may be relevant to you and your doctor or nurse etc will discuss it with you

What will happen during the study?

- 1st GP appointment - care plan prepared with you
- You will see your care plan when you next log in
- Access/update your care plan in the system whenever you wish
- Each time you see a healthcare professional who is part of the trial, e.g. doctor, nurse, dietician, they will check your record, discuss your care plan with you & make any updates

How will I be trained?

- This session
- System User Manual
- On-line Video Tutorial
- Multi-morbidity video
- Project Guide Book
- Ad hoc help from the project team

2. Provide us with feedback on your experience with using the system

Questionnaires

- Questionnaires will be sent to you through the PEP system which ask you a series of questions about what you think of the system
- Fill them in when requested & return anonymised results to empirica, one of the partners in the C3-Cloud trial

3. Allow us to use your information to assess the effectiveness & usefulness of the system

Information in the C3-Cloud System

- Care information, e.g. illnesses, treatments etc
- Comes from health records
- Accessed by:-
 - Professionals looking after you
 - Project team - running the study
 - Technical partners – when fixing bugs. Data sharing agreements, bound by confidentiality, no data taken off site

Evaluation Data

- Anonymised data about your care & treatment during the study
- Taken from your GP & hospital health records & from the C3-Cloud system
- Accessed by:-
 - Project team
 - Research partners in Germany & Spain (non-identifiable data only)

Next Steps

- Give you access to the materials you need:-
 - Wallet card – carry it to appointments
 - Multi-morbidity video
 - Project Guide Book
 - System User Manual
 - System video tutorial
 - Login for the system
- See the GP so that your can plan can be prepared

Appendix 3 - RJH Local materials

1. Patient and Carers Information Sheet



Forskningsprojektet C3-Cloud – information om projektet till patienter som erbjuds att delta

Studiens bakgrund och syfte

C3-Cloud är en gemensam europeisk forskningssatsning. Målet är att med hjälp av datorer och andra tekniska hjälpmedel underlätta för patienter med flera samtidiga kroniska sjukdomar att hålla kontakt med vården, att följa och påverka sin vårdplan och att lära sig mera om sina sjukdomar och sin behandling.

De råd och den information som ges deltagarna tas automatiskt fram av datorer och deltagarna får en personligt utformad information beroende på vilka diagnoser och läkemedel man har. Information om diagnos och behandling hämtas automatiskt från sjukvårdens journalsystem i Region Jämtland Härjedalen.

En personlig vårdplan upprättas på samma sätt automatiskt. Den behandlande läkaren läser igenom vårdplanen och godkänner den eller gör vid behov ändringar i texten. Därefter kan Du och alla vårdgivare Du brukar träffa se och använda vårdplanen. Vårdgivare kan för någon vara enbart läkare och sköterska i primärvården medan det för andra även kan vara andra personalkategorier, en vårdgivare vid en sjukhusklinik samt personal från kommunens hemsjukvård. Vårdplanen uppdateras automatiskt om t.ex. någon ny sjukdom tillstöter eller om läkemedlen ändras.

Förutom ovanstående får Din läkare och annan vårdpersonal också tillgång till aktuella rekommendationer rörande behandlingen av Dina sjukdomar. Dessutom får läkaren/sköterskan information om läkemedelskombinationer som skulle kunna vara skadliga. I C3-Cloudprojektet erbjuds patienter med minst två kroniska sjukdomar att delta. De aktuella sjukdomarna i studien är diabetes typ 2, hjärtsvikt, lätt till måttligt nedsatt njurfunktion (njursvikt) eller depression.

Om Du som patient önskar det kan även någon av dina närstående vara med i C3-Cloud och de kommer då att få se samma informationsmaterial som Du, liksom även Din vårdplan.

I denna studie vill vi utvärdera det nya systemet och bedöma hur användbart det är både för patienter och för vårdgivare.

Förfrågan om deltagande

Du är redan patient vid en hälsocentral som deltar i C3-Cloud-studien och Du har minst två av de fyra diagnoserna som nämns ovan. Därför tillfrågas du nu om du vill delta i studien.



Hur går studien till

Om Du anmäler att Du är villig att delta i studien kommer Du att lottas till att hamna i en av två grupper. Den ena gruppen kommer att använda det nya systemet medan den andra gruppen behandlas som vanligt och därmed kommer att vara en kontrollgrupp.

Kontrollgruppen fortsätter sina kontakter och sin behandling vid hälsocentralen precis som vanligt under de 15 månader studien pågår och märker på det sättet inte av studien.

Patienterna i den grupp som använder det nya systemet kommer att behöva använda en internetansluten dator eller läsplatta från tid till annan. En viss kännedom om att använda datorer och internet är därför nödvändig för att delta i studien, men djupare datorkunskap behövs inte. Har inte du sådan kännedom själv så har du kanske någon närstående som kan hjälpa till.

Om Du lottas till den grupp som använder det nya systemet kommer Du att när som helst kunna se din personliga vårdplan hemifrån. Vissa patienter kommer också att kunna spela in vissa mätdata som blodtryck eller blodsocker från hemmet. Du kommer också ha tillgång till utbildningsmaterial som hjälper dig att själv hantera din egenvård. Du kommer även att ha möjlighet att kommunicera med din vårdpersonal via C3-Cloud. Alla som tillhör den grupp som använder det nya systemet, kommer att få utbildning och personlig vägledning i hur man använder den nya systemet och Du kan själva bestämma hur ofta Du vill använda det.

För båda grupperna kommer viss information att hämtas från journaler (antalet besök i sjukvården, antalet dagar inlagd på sjukhus, läkemedelsanvändning för alla och i fall det är relevant för deltagarnas sjukdom uppgift om blodtryck, njurfunktionsvärden samt diabetesprovet HbA1c). Den grupp som använder det nya systemet kommer att bli ombedda att svara på frågeformulär med frågor om hur man upplever sin situation och vad man tycker om det nya systemet.

Finns det några risker?

Det förväntas inga hälsorisker. Det kommer inte att vara några nya läkemedel som testas och alla hälsoråd som ges och alla behandlingar som föreslås kommer att vara väl etablerade och i enlighet med nationella rekommendationer.



Hantering av data och sekretess

Alla uppgifter som samlas in om dig under studien kommer att hanteras strikt konfidentiellt. Materialet kommer att slumpmässigt kodas med en utvald fyrsiffrig kod. Kodnyckeln kommer att förvaras inlåst och inga obehöriga kommer att ha tillgång till dem. Personuppgiftsansvarig är Region Jämtland Härjedalen. Du kan en gång per år kostnadsfritt begära ut vilka uppgifter som finns registrerade på dig och du har även rätt att begära rättelse av uppgifter som är felaktiga. En skriftlig begäran skickas då av dig till:

Personuppgiftsansvarig: Region Jämtland Härjedalen
Box 654
831 27 Östersund

Under studiens gång behöver studieteamet tillgång till journalhandlingar som rör din hälsa. Även en oberoende kontrollant, en så kallad monitor, kan komma att behöva tillgång till dina journalhandlingar under studien gång. Dina uppgifter kommer att behandlas enligt Personuppgiftslagen, PUL (SFS 1998:204) och förvaras så att ingen obehörig kan ta del av dessa.

Alla insamlade uppgifter kommer att hanteras på gruppnivå, där det inte kommer att vara möjligt att identifiera någon enskild deltagare och resultaten redovisas i vetenskapliga artiklar.

Ansvariga

Nedanstående organisation är formellt ansvarig för projektet i ditt område.

Region Jämtland Härjedalen
Box 654, 83127 Östersund

Har du frågor rörande studien och ditt deltagande är du välkommen att ta kontakt med

Mikael Lilja, Specialistläkare allmänmedicin
FoU enheten, Östersunds sjukhus
Box 654, 831 27 Östersund
Telefon: 063 – 15 30 05
Mejladress: mikael.lilja@regionjh.se

Frivillighet



studien, kan Du göra det när som helst och utan att ge någon anledning och utan att det påverkar din fortsatta vård. Om även en närstående undertecknat ett samtyckesformulär kan både Du och den närstående återta den närståendes deltagande i studien.

Om Du vill återta ditt samtycke ska Du meddela kontaktpersonen dr Mikael Lilja (uppgifter ovan). C3-Cloud systemet kommer då att sluta användas för din vård och inga ytterligare uppgifter kommer att samlas in. För att veta hur vi då ska göra med de uppgifter som finns för din del i projektet ber vi att Du i så fall anger ett av följande två alternativ:

- a) de uppgifter som redan finns registrerade kan användas i utvärderingen;
- b) de uppgifter som redan finns registrerade ska inte användas i utvärderingen.

Det här är en forskningsstudie, vilket innebär att när studien är slut efter 15-månader kommer beslut att fattas om C3-Cloud tjänsterna kommer att fortsätta användas.

Samtycke till att delta i studien

Innan Du börja delta i studien ska Du underteckna ett samtyckesformulär där Du godkänner att vara med i studien och att Du känner till förutsättningarna för studien.

Om Du vill att någon närstående stödperson ska hjälpa dig med hanteringen av C3-Cloud-verktyget om Du lottas till interventionsgruppen, så ska ni båda skriva under samtyckesformuläret.

Nästa steg

Tillsammans med denna information finns också ett kort frågeformulär om din datorvana. Om Du vill delta i studien ber vi att Du även fyller i den enkäten och skickar tillbaka den, tillsammans med det undertecknade samtyckesformuläret i bifogade svarskuvert. I början på hösten 2018 får Du information om Du lottats till att få prova C3-Cloud eller om Du tillhör kontrollgruppen. Du som lottas till att prova C3-Cloud kommer att inbjudas till information på eller nära din hälsocentral under hösten och i november 2018 kommer det 15 månader långa testet att börja.

2. Workshop Invitation Letter



Östersund 2019-04-10

Inbjudan till informationsmöte C3-Cloud

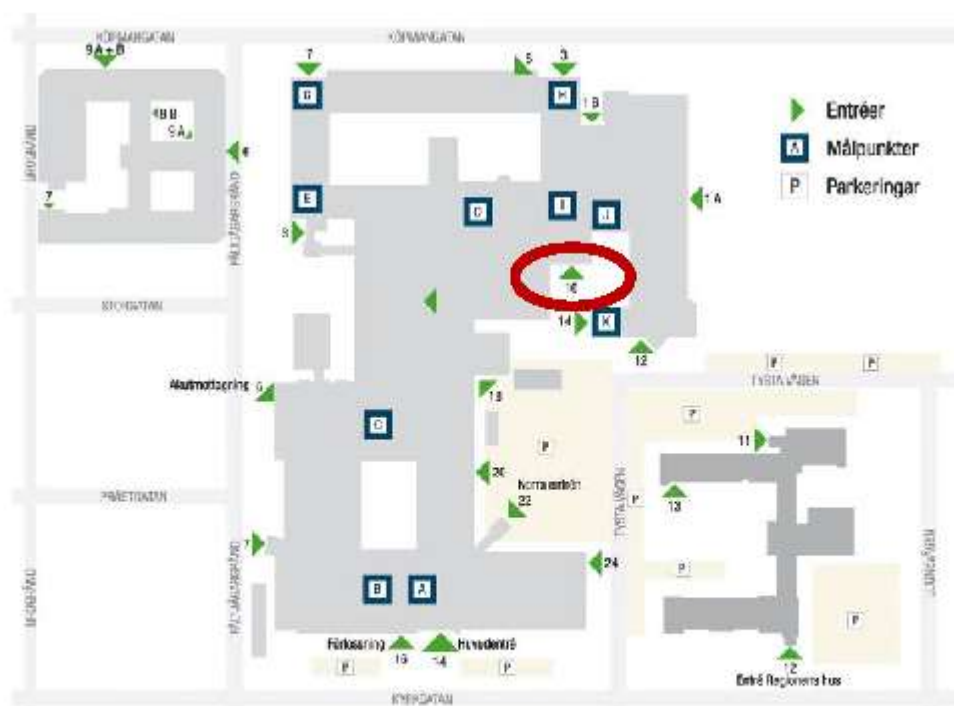
Vi tackar för ditt tålamod då starten av C3-cloud studien blivit fördröjd. Det har skett en förändring i studieupplägget vilket innebär att alla som deltar i C3-Cloud kommer vara aktiva testare och utvärderare av internet-programmet. Från mitten av maj förväntas projektet att starta och pågå fram t.o.m. januari 2020. Vi vill nu informera dig om planeringen.

Informationsmöten

Information kring hur C3-Cloud fungerar och hur du använder det kommer att ges på Östersunds sjukhus, detta gäller för dig som bor i Östersunds kommun. Du som bor i Krokom, Föllinge och Backe-området kommer att få möjlighet att delta via video-länk på din hälsocentral. Det är inget krav att du går på informationsmötet, det finns möjlighet till egen inläsning om man föredrar det eller inte har möjlighet att delta. Du är välkommen en av dessa tider som passar dig och du behöver inte föranmäla dig. Om du tidigare angett att närstående skall hjälpa dig och få tillgång till C3-Cloud och dina uppgifter, är även din närstående välkommen till någon av dessa informationsmöten. Vi ber dig i så fall att du informerar din närstående. Observera att ingen ersättning utgår från studien för resor till och från informationsmötet.

Informationsmöten på Östersunds sjukhus, hörsalen "Snäckan", ingång från Tvsta vägen 16

2:a maj	kl. 14.30-16:00
3:e maj	kl. 10.30-12:00
13:e maj	kl. 10.30-12:00
13:e maj	kl. 14.30-16:00



Deltagarinformation C3-Cloud version 1, april 2019



Informationsmöten på hälsocentralerna i Krokom och Föllinge (via video-länk)

2:a maj kl. 14.30-16.00 eller 13:e maj kl. 14.30-16.00

Informationsmöte på hälsocentralen i Backe (via video-länk)

13:e maj kl. 10.30-12.00

Kan du inte delta vid något av dessa möten?

Du kan hitta informationsmaterial på: www.regionjh.se/c3info, materialet kommer finnas tillgängligt i början av maj.

BankID

För att kunna logga in till C3-Cloud behöver du kunna identifiera dig med hjälp av BankID. Om du inte har tillgång till BankID kontaktar du din bank som kan hjälpa dig med detta. Om du angett att du vill ha hjälp av närstående behöver även denne ha tillgång till BankID.

Registrering av uppgifter inför studiestart

För att kunna aktivera dig i studien behöver vi samla in din e-post, fyll i bifogad blankett och sänd åter i svarskuvertet.

Om du har angett att du ska ha hjälp av en närstående som skall ha tillgång till dina uppgifter i C3-Cloud behöver vi samla in den närståendes e-post och personnummer. De deltagare som angett hjälp av närstående kommer att med detta brev även få en blankett som skall füllas i av både deltagare och närstående, sänds åter med bifogat svarskuvert.

Startsida för internet-programmet (från studiestart i mitten av maj)

För att kunna logga in i C3-cloud besök adress: <https://c3cloud-pep.regionjh.se>, här kommer du så snart du är aktiverad kunna logga in med hjälp av BankID. När du aktiveras kommer det skickas ett meddelande från C3-cloud till den e-post du angett. Har du hjälp av en närstående kommer både du och din närstående få ett meddelande från C3-cloud till den e-post som angetts.

Webbläsare på dator/läsplatta

Följande webbläsare fungerar:

- Chrome
- Firefox
- Edge
- Safari
- För Internet Explorer behöver du en nyare version, minst version 11

Hälsningar,

Mikael Lilja, forskningsansvarig läkare

E-post: mikael.lilja@regionjh.se

Postadress: FoU-enheten
Box 654
831 27 Östersund

Kort om studien: C3-Cloud syftar till att ge IT-stöd och information till patienter med mer än en kronisk sjukdom/tillstånd, och om man så önskar även samma stöd till närstående. Patientens läkare, sköterska och övrig vårdpersonal får även tillgång till ett medicinskt beslutsstöd för att utforma en personlig vårdplan för patienten. Vårdplanen blir tillgänglig och gemensam för patienten och all vårdpersonal. Vårdplanen kan även användas för att utbyta information och meddelanden. C3-Cloud testas samtidigt i Jämtland Härjedalen, i södra England samt i Baskien.

Deltagarinformation C3-Cloud version 1, april 2019

Appendix 4 - BC Local materials

1. Covering Letter for eligible Patients

«Nombre» «Apellido_1» «Apellido_2»
«Dirección»
«Cod_Postal» «Municipio»

Estimado Sr./Sra. «Nombre»:

Osakidetza y Kronikgune (Centro de investigación en cronicidad) participan en el Proyecto Europeo C3-Cloud (<http://c3-cloud.eu/>), cuyo objetivo es generar planes de atención personalizados para pacientes con más de una enfermedad crónica, en colaboración con los profesionales que participan en su atención y utilizando un nuevo sistema informático.

Queremos evaluar la utilidad y la facilidad de uso del nuevo sistema en la atención clínica. Para eso se va a realizar un estudio piloto en pacientes crónicos no complejos. Debido a que usted tiene una enfermedad crónica (diabetes, insuficiencia cardíaca, insuficiencia renal o depresión), es una de las personas que podría participar.

El objetivo de esta carta es anunciarle que en unos días recibirá una llamada telefónica de su médico de familia y/o enfermera para invitarle a participar en el proyecto, y se le dará más información. Los pacientes que participen, o las personas de confianza que les cuiden, deben utilizar de forma habitual teléfonos móviles o "tablets" u ordenadores, y navegar por internet para realizar actividades como leer prensa, consultar correo electrónico, buscar información on-line, realizar transacciones de banca electrónica, etc. Los datos personales que se obtengan durante el estudio serán tratados de forma confidencial e íntegra de acuerdo a las disposiciones legales.

Su participación es voluntaria, no teniendo ningún tipo de repercusión en la relación asistencial con los profesionales que le atienden si no quiere participar.

Ante cualquier duda que le surja previa a la llamada puede consultarla con su médico o centro de salud.

Muchas gracias de antemano por su colaboración.

Firmado

2. Patient Information Sheet



Proyecto C3-Cloud: Desarrollo de una arquitectura para el cuidado y atención en colaboración con el enfermo pluripatológico, mediante planes personalizados, y la gestión de la polifarmacia (Acuerdo nº 689181)

Hoja de información para pacientes que participan en el estudio de evaluación de C3-Cloud

Antecedentes y objetivo

Este proyecto es un esfuerzo conjunto europeo para el desarrollo de un nuevo y mejor uso de los sistemas informáticos para mejorar la atención de las personas mayores que padecen múltiples afecciones crónicas. Este proyecto está dirigido a pacientes con al menos dos de las siguientes enfermedades: Diabetes tipo II, Insuficiencia cardíaca, Insuficiencia renal o Depresión. El objetivo es facilitar la planificación y la gestión del mejor tratamiento a partir de las guías clínicas basadas en la evidencia para mejorar la calidad de la atención. También pretende reducir combinaciones dañinas de medicamentos.

Un aspecto importante del proyecto es incluir a los pacientes como usuarios del nuevo sistema de TICs (Tecnologías de la Información y Comunicación), y también a los familiares más cercanos (cuidadores informales) si usted elige hacerlo.

¿Por qué le estamos pidiendo que participe?

Usted ya es paciente de uno de los centros de salud que participa en el estudio y padece al menos dos de las cuatro condiciones mencionadas anteriormente. El proyecto C3-Cloud tiene como objetivo apoyar e informar mejor a los pacientes con múltiples afecciones crónicas (pluripatológicos) y a sus cuidadores sobre el desarrollo de su plan de atención individualizado con el uso de herramientas TIC. En este estudio, queremos evaluar el nuevo sistema TIC y valorar su utilidad para pacientes y profesionales de la atención.

¿Qué significa participar en el estudio?

Para participar en el estudio, es necesario estar familiarizado mínimamente con el uso de los ordenadores y de Internet. Para ello le solicitamos que lea y responda las tres preguntas del cuestionario "Auto evaluación de manejo de Tecnologías de la Información y Comunicación (TICs)", que aparece como anexo de este documento. En caso de respuesta afirmativa a las tres, usted cumpliría con los requisitos de uso de los ordenadores necesario.

Si acepta participar en el estudio, se le asignará al grupo intervención y será seguido durante el período de duración del estudio (12 meses). Para utilizar el nuevo sistema TIC, necesitará usar un dispositivo doméstico conectado a Internet de vez en cuando, preferiblemente una "Tablet" o similar. Recibirá orientación personal y formación al respecto, como parte del proceso de reclutamiento.

El sistema C3-Cloud le permitirá ver su plan de atención personal en todo momento y desde su hogar. A algunos pacientes también se les pedirá que registren ciertos datos de medición, por ejemplo, presión arterial desde el hogar. También tendrá acceso a material educativo para ayudarle a auto gestionar sus condiciones. Además, el sistema C3-Cloud permite a los pacientes comunicarse con los miembros de su equipo de atención médica. Puede decidir con qué frecuencia desea usar las herramientas de Internet.

Se recopilará cierta información de sus registros clínicos para el análisis estadístico. Además tendrá que responder a varios cuestionarios. Las respuestas serán totalmente anónimas.

Aunque se les pedirá que indiquen en sus respuestas su sexo, rango de edad y el sitio piloto de



que proceden, los datos no podrán ser rastreados hasta los pacientes, ya que los datos de la fuente no serán accesibles para el equipo de evaluación.

Todos los datos recopilados serán analizados de forma anónima por socios autorizados con un acuerdo de confidencialidad firmado. El equipo de investigación almacenará sus datos anonimizados de manera segura tanto tiempo como exijan los requisitos de su país, después de la publicación de los resultados del estudio.

Los datos de evaluación se almacenarán por el Coordinador del proyecto por un periodo de 10 años, mientras que los datos identificables quedarán almacenados en los sistemas locales para el acceso del equipo del proyecto durante 12 meses después de finalizar el estudio. La transferencia de los datos se realizará mediante intercambio de archivos de datos cifrados.

Un subgrupo de los pacientes del grupo de intervención evaluará las aplicaciones C3-Cloud al comienzo del estudio. La aleatorización de este subgrupo, se hará utilizando la misma herramienta de aleatorización nombrada anteriormente. Mediante un cuestionario específico se les preguntarán cuestiones relativas a su capacidad en utilizar el sistema, nada más comenzar el estudio. Después del período de prueba del proyecto, se les harán una serie de preguntas para conocer su opinión sobre el uso del sistema. Las respuestas se analizarán de forma anónima de igual modo a como se ha descrito previamente.

Al aceptar participar en el estudio, usted participa en la investigación, lo que implica que los servicios de C3-Cloud no se utilizarán como atención clínica estándar una vez finalizado el estudio.

¿Implica riesgos?

No, no implica riesgos de salud. No se probarán nuevos medicamentos y todos los tratamientos combinados serán métodos bien establecidos, ya aprobados y conocidos por sus profesionales de la salud. Todos los datos personales estarán protegidos para garantizar su privacidad y confidencialidad, y solo estarán disponibles para los profesionales de su equipo de atención que sean responsables de su atención o para los profesionales con acuerdos de confidencialidad firmados.

¿Hay algún beneficio por participar?

Esperamos que aprecie la oportunidad de ayudar al progreso de la investigación que puede conducir a una atención más efectiva para pacientes como usted.

La participación en el grupo de intervención permite una posibilidad única de estar mejor informado sobre sus problemas de salud y participar en la planificación de la atención de maneras nuevas. Las innovadoras funciones del sistema permiten un acceso más fácil a la información para los profesionales que lo atienden, para usted y, si lo desea, para su cuidador informal.

Gestión y personas de contacto responsables:

La siguiente organización es formalmente responsable del proyecto en su área. La persona indicada más abajo puede responder preguntas sobre el proyecto y su participación.

Nombre de la organización

Dirección



Nombre persona contacto
(Investigador Principal de la OSI)

Teléfono

e-mail

Participación y posibilidad de retirarse del proyecto

Su disposición a participar es completamente voluntaria y depende de su acuerdo firmado en el formulario de consentimiento informado. Si cambia de opinión y decide retirarse del estudio, puede hacerlo en cualquier momento sin proporcionar ningún motivo. El tratamiento que reciba si abandona el estudio C3-Cloud será el tratamiento habitual que normalmente recibiría.

Si desea retirarse del estudio, debe informar a la persona de contacto responsable (información que debe ser localizada) e indicar una de las siguientes tres opciones:

- ☐ Abandono la intervención pero accedo a rellenar los cuestionarios al final del estudio y accedo a que la información recogida durante mi participación en el estudio sea consultada en un futuro.
- ☐ Abandono la intervención y no deseo ser contactado para responder los cuestionarios al final del estudio. Accedo a que la información recogida durante mi participación en el estudio sea consultada en un futuro.
- ☐ Abandono la intervención y no deseo ser contactado para responder los cuestionarios al final del estudio. No accedo a que la información recogida durante mi participación en el estudio sea consultada en un futuro.

Si acepta participar, le ofreceremos más información cuando visite el centro de salud. Antes de que pueda comenzar el estudio, deberá firmar un formulario de consentimiento que acepte las condiciones del estudio.

Próximos pasos

Ya puede completar la "Auto evaluación de manejo de las Tecnologías de la Información y Comunicación (TICs)" que debe está adjunto a esta hoja de información. Si responde afirmativamente a las tres preguntas y desea participar en el estudio, puede contactar con su profesional de la salud.

3. C3-Cloud Workshop Presentation for HCPs



Sesión formación a profesionales

- Presentación proyecto
- Intervención en el País Vasco
- Demo de la plataforma

Proyecto C3-Cloud

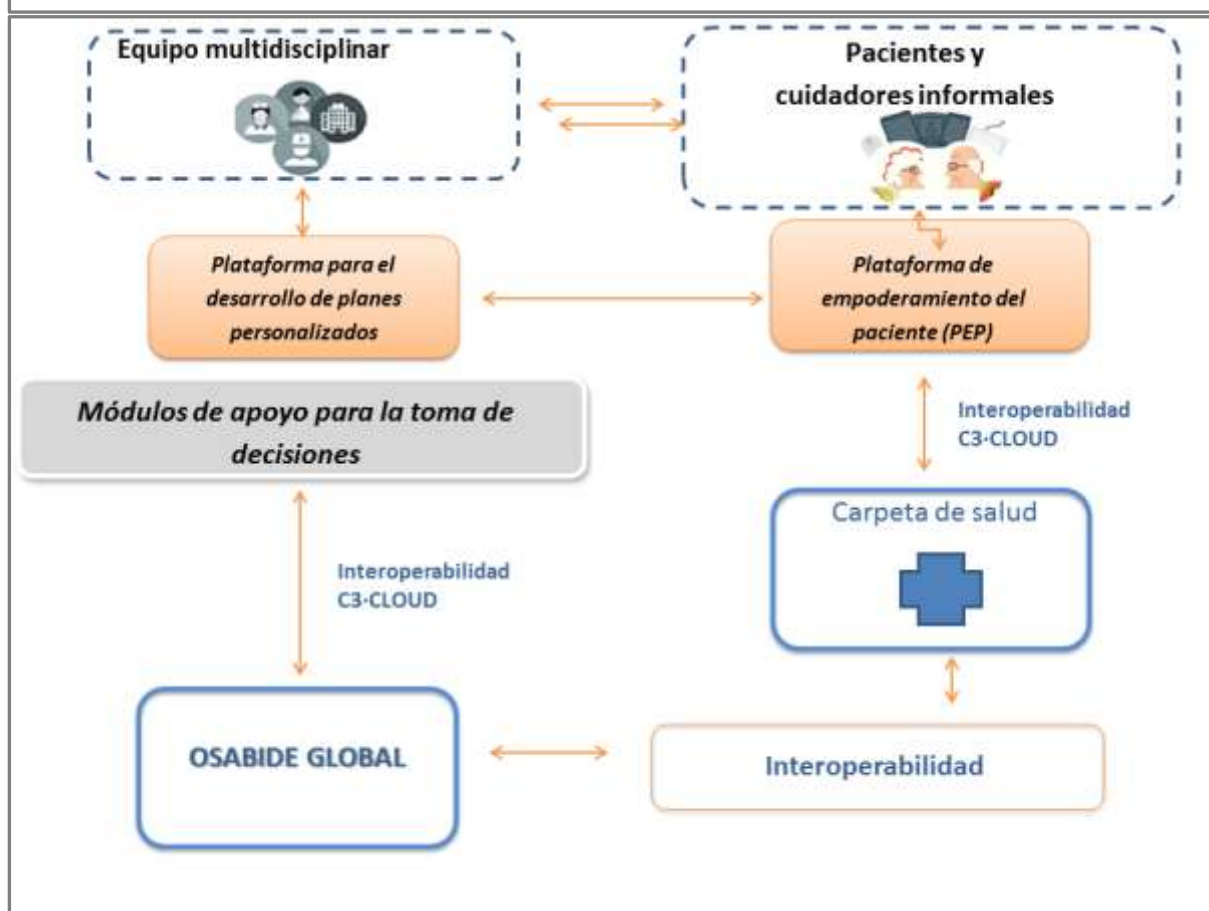
- **Título:** Desarrollo de una **arquitectura** en la nube para el **cuidado y atención** en **colaboración** con el **enfermo pluripatológico, mediante planes personalizados, y la gestión de la polifarmacia.** (*A Federated Collaborative Care Cure Cloud Architecture for Addressing the Needs of Multi-morbidity and Managing Poly-pharmacy*)
- **Consorcio:** 12 socios
- **Coordinador:** UNIVERSIDAD DE WARWICK, Reino Unido.
- **Comienzo proyecto:** mayo 2016
- **Duración:** 48 meses
- **Convocatoria:** PHC-25-2015, H2020, EU

Consorcio – C3-Cloud



Objetivo

- Desarrollo de **planes** de atención **personalizados** para pacientes **pluripatológicos complejos**, basados en la **evidencia** y apoyados en **herramientas TIC** y gestionados por un **equipo multidisciplinar coordinado** que fomenten la **atención integrada** y la implicación del **paciente y/o cuidador**.



Pregunta principal de la intervención

- ¿Es el **uso de una herramienta TIC personalizada**, que permite la planificación de la atención coordinada, la optimización del tratamiento y la autogestión del paciente, **aceptable** para **pacientes pluripatológicos** crónicos y para **el equipo de profesionales** que lo atiende? ".

Variable Principal

- **La aceptabilidad de la tecnología C3-Cloud:**
 - Satisfacción del usuario
 - Percepción de la atención clínica
 - Utilización de recursos sanitarios
 - Frecuencia de uso
 - Utilidad percibida
 - Impactos inesperados

Pilotaje Paciente pluripatológico C3-Cloud

Enfermedades crónicas:

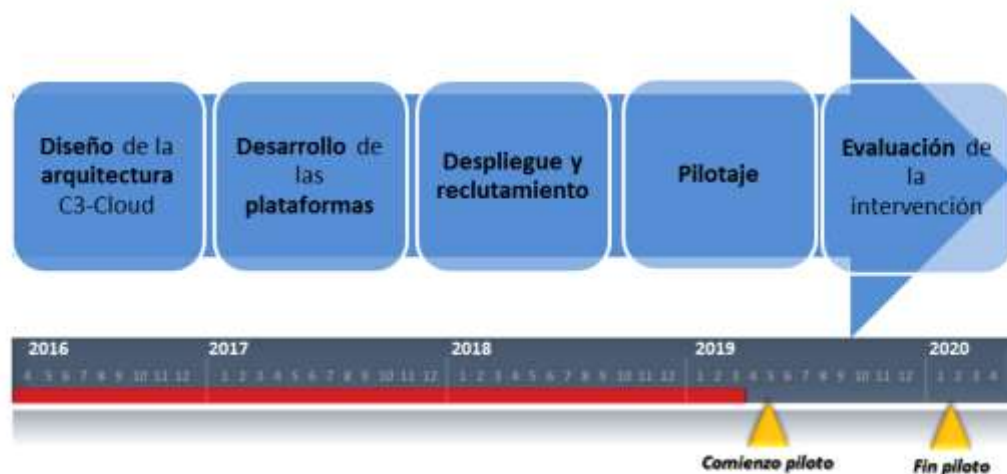


Paciente Pluripatológico:

Al menos 2 de las 4 enfermedades

>55 años

Fases del proyecto

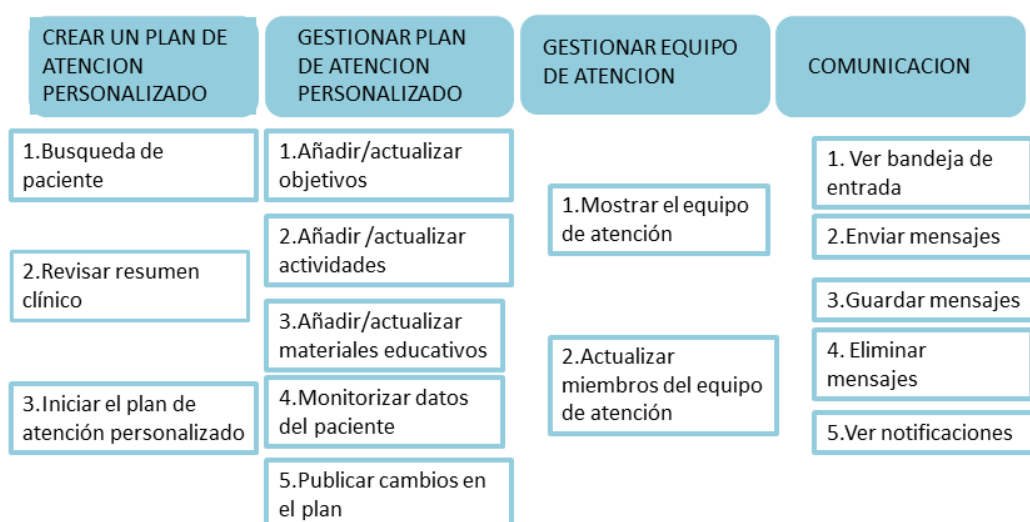


Elementos del Plan de Atención Personalizado

- **Problemas de salud**
- **Objetivos**
 - Personalizados
 - Temporizados
 - Cuantificados
 - Basados en la evidencia
- **Actividades**
 - Relacionados con objetivos
 - Tipos (8): Acciones del paciente, Medicación, Dieta, Análisis, Cita, Derivación, Cuestionario, General
 - Multidisciplinares (ejecutados por diferentes agentes)
 - Basados en la evidencia
- **Materiales educativos/formativos**
 - Adaptados al proyecto
 - Personalizados
 - Accesibles



Actividades que el profesional puede realizar en C3DP



- Presentación proyecto
- **Intervención en el País Vasco**
- Demo de la plataforma

Intervención en País Vasco

- **Estudio:**
 - **254** pacientes **intervención**
 - **Médicos y Enfermeras de Atención Primaria**
 - **9 meses (mayo 2019-enero 2020)**

Intervención en País Vasco

- **Estudio:**

- **254** pacientes **intervención**
- **Médicos y Enfermeras de Atención Primaria**
- **11 meses (marzo 2019-enero 2020)**

OSIs	Nº Centros de Salud	Nº Médicos de familia	Nº Enfermeras
OSI Alto Deba	1	4	5
OSI Araba	3	21	>12*
OSI Barrualde			
OSI Debabarrena	2	4	4
OSI Donostialdea	2	28	20
OSI Ezkerraldea Enkarterri Cruces	1	6	10
OSI Tolosaldea	4	5	1
TOTAL	13	68 (cupos)	>52

¿Y yo qué tengo que hacer?



Reclutamiento pacientes



Criterios de inclusión

- Tienen **55 años o más**
- Son **pacientes pluripatológicos**, según las series propuestas
- Todavía **viven** y generalmente planean vivir **en su hogar** (o en la comunidad) durante los meses de duración de la prueba.
- Ellos, o sus cuidadores, superan el test de manejo de las Tecnologías de la Información y Comunicación (TIC)
- Ellos, o sus cuidadores, tienen **acceso estable a internet** y al menos **uno de los siguientes dispositivos disponibles: ordenador, Smartphone o Tableta**. Esto incluye el uso de los navegadores de Internet
- Pueden **dar su consentimiento informado**.

CREACION DE UN PLAN DE CUIDADOS

Resumen clínico de 2019 11:21:04 hrs. Última recuperación de datos del sistema local. [Actualizar](#)

Problemas de salud

Diagnóstico	Fecha	Estado
INSUFICIENCIA CARDÍACA	14 feb. 2019	Activo
INSUFICIENCIA RENAL CRÓNICA	03 oct. 2018	Activo
INSUFICIENCIA RENAL CRÓNICA	03 oct. 2018	Activo
CARDIOPATÍA ISQUÉMICA	03 oct. 2018	Activo
CARDIOPATÍA ISQUÉMICA	03 oct. 2018	Activo
DOLOR CRÓNICO	03 oct. 2018	Activo
DOLOR CRÓNICO	03 oct. 2018	Activo
ALTERACIÓN DE LA PERSONALIDAD	03 oct. 2018	Activo
ALTERACIÓN DE LA PERSONALIDAD	03 oct. 2018	Activo
ICTUS	03 oct. 2018	Activo

Medicamentos

Producto	Dosis	Frecuencia	Indicador
PANTOPRAZOL 40MG 28 COMP GASTRORESISTENTE	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
LANTUS SOLISTAR 100 UNIDADES / ML 3 PLUMAS PRECARGADAS INS.	0	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
IVAROXASAN 10MG 30 COMPRIMIDOS RECUBIERTOS	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
FUROSEMIDA 40MG 20 COMPRIMIDOS	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
ESPRONOLACTONA 25MG 30 COMPRIMIDOS	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
BISOPROLOL 2,5MG 28 COMPRIMIDOS	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018
ATORVASTATINA 20MG 28	1	(Frecuencia) veces por (período) (unidad)	05 oct. 2018

CREACION DE UN PLAN DE CUIDADOS

Metas

Meta	Fecha de inicio	Fecha de fin	Estado
Reducir el riesgo de infección	14 feb. 2019	14 mar. 2019	Completado
Reducir el riesgo de infección	14 feb. 2019	14 mar. 2019	Completado
Reducir el riesgo de infección	14 feb. 2019	14 mar. 2019	Completado
Reducir el riesgo de infección	14 feb. 2019	14 mar. 2019	Completado

Actividades

Actividad	Fecha de inicio	Fecha de fin	Estado
Realizar la higiene personal	14 feb. 2019	14 mar. 2019	Completado
Realizar la higiene personal	14 feb. 2019	14 mar. 2019	Completado
Realizar la higiene personal	14 feb. 2019	14 mar. 2019	Completado
Realizar la higiene personal	14 feb. 2019	14 mar. 2019	Completado

Materiales educativos

Material	Fecha de inicio	Fecha de fin	Estado
Guía de cuidados de la herida	14 feb. 2019	14 mar. 2019	Completado
Guía de cuidados de la herida	14 feb. 2019	14 mar. 2019	Completado
Guía de cuidados de la herida	14 feb. 2019	14 mar. 2019	Completado
Guía de cuidados de la herida	14 feb. 2019	14 mar. 2019	Completado

Evaluación Profesionales

TÍTULO CUESTIONARIO	DESCRIPCIÓN	Nº PREGUNTAS	TIEMPO ESTIMADO	FECHA
UTAUT MDT [1ª parte] (Teoría unificada de aceptación y uso de tecnología)	Explicar la actitud y el comportamiento de los usuarios cuando se enfrentan a una nueva tecnología	20	5 min	Marzo 2019
QUIS7 MDT [1ª parte] (Satisfacción de la interacción del usuario)	Evaluar la satisfacción subjetiva del usuario cuando interacciona con las plataformas C3-Cloud	19	3 min	Marzo 2019

Evaluación Profesionales

TÍTULO CUESTIONARIO	DESCRIPCIÓN	Nº PREGUNTAS	TIEMPO ESTIMADO	FECHA
Cuestionario al profesional	Evaluar el impacto de la implementación de C3-Cloud en los profesionales de la salud	36	9 min	Enero 2020
eCUI5 MDT (Impacto de la implementación de C3-Cloud en el profesional)	Evaluar la utilidad que la aplicación C3-Cloud aporta a los profesionales como usuarios de la misma	22	6 min	Enero 2020
QUIS7 [2ª parte]	Evaluar la satisfacción subjetiva del usuario cuando interacciona con las plataformas C3-Cloud	64	10 min	Enero 2020
UTAUT MDT [2ª parte]	Explicar la actitud y el comportamiento de los usuarios cuando se enfrentan a una nueva tecnología	25	5 min	Enero 2020

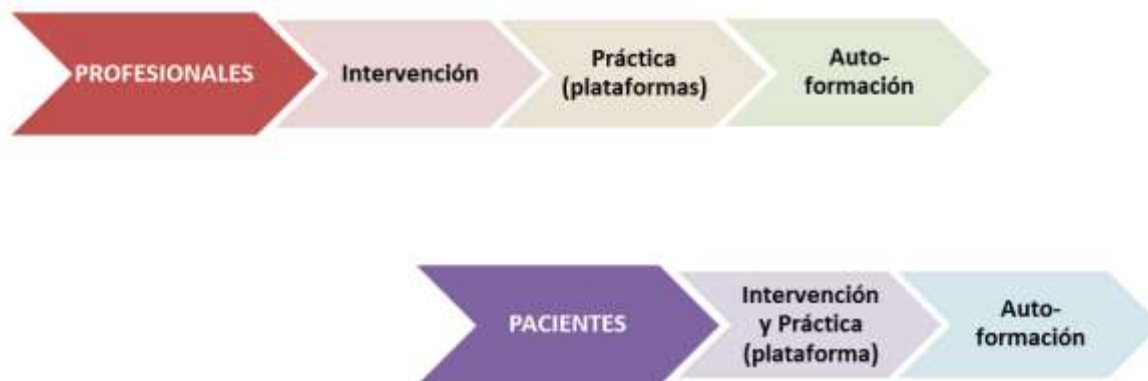
Evaluación (TODOS LOS PACIENTES)

TÍTULO CUESTIONARIO	DESCRIPCIÓN	Nº DE PREGUNTAS	TIEMPO ESTIMADO	FECHA
UTAUT Pacientes [1ª parte] (Teoría unificada de aceptación y uso de tecnología)	Explicar la actitud y el comportamiento de los usuarios cuando se enfrentan a una nueva tecnología	19	5 minutos	Marzo 2019
eCCIS Pacientes (Impacto de la implementación de C3-Cloud en pacientes y/o cuidadores)	Evaluar la utilidad que la aplicación C3-Cloud aporta a los pacientes usuarios de la misma	22	6 minutos	Enero 2020
UTAUT Pacientes [2ª parte] (Teoría unificada de aceptación y uso de tecnología)	Explicar la actitud y el comportamiento de los usuarios cuando se enfrentan a una nueva tecnología	21	5 minutos	Enero 2020

Evaluación 50 pacientes (submuestra)

TÍTULO CUESTIONARIO	DESCRIPCIÓN	Nº DE PREGUNTAS	TIEMPO ESTIMADO	FECHA
Cuestionario al paciente [1ª parte]	Evaluar el impacto de la implementación de C3-Cloud en el paciente	4	2 minutos	Marzo 2019
QUIS7 [Primera parte] (Satisfacción de la interacción del usuario)	Evaluar la satisfacción subjetiva del usuario cuando interacciona con las plataformas C3-Cloud	19	3 minutos	Marzo 2019
Evaluación de materiales de formación [1ª parte]	Evaluación de los materiales para el paciente que se le pueden asignar a través de la PEP	16	4 minutos	Marzo 2019
Cuestionario al paciente [Segunda parte]	Evaluar el impacto de la implementación de C3-Cloud en el paciente	13	3 minutos	Enero 2020
QUIS7 [2ª parte] (Satisfacción de la interacción del usuario)	Evaluar la satisfacción subjetiva del usuario cuando interacciona con las plataformas C3-Cloud	64	10 minutos	Enero 2020
Evaluación de materiales de formación [2ª parte]	Evaluar si los materiales de capacitación se han utilizado y con qué frecuencia.	9	3 minutos	Enero 2020

Formación

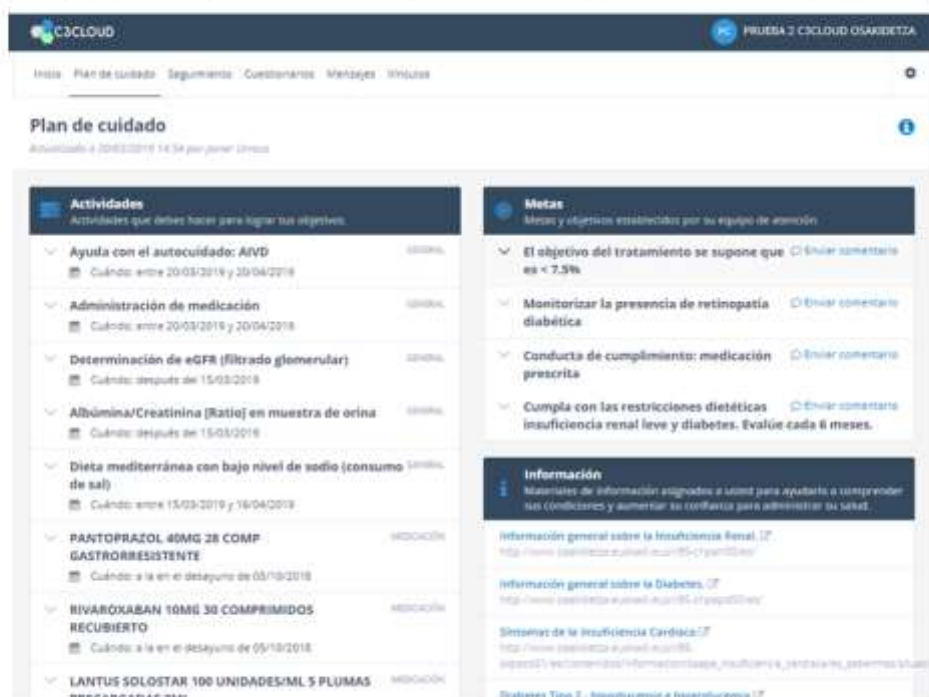


- Presentación proyecto
- Intervención en el País Vasco
- **Demo de la plataforma**

PLATAFORMA DE EMPODERAMIENTO DEL PACIENTE



PLATAFORMA DE EMPODERAMIENTO DEL PACIENTE



- <https://app.srdc.com.tr/c3dp>

- username: anna_svensson

- password: password

- username: bc_urraca

- password: password

- <https://c3clouddev.medixine.com/>

- Usuario: george.best@mailinator.com

- Contraseña: password1

Eskerrik asko

www.kronikgune.org

www.c3-cloud.eu

Mariaremedios.vegainigo@osakidetza.eus

dverdoy@kronikgune.org

Appendix 5 - Wallet card

1. SWFT



Please use the C3-Cloud system to access your personal care plan & supporting information at the following link

www.c3pepweb.swft.nhs.uk

Further information about the C3-Cloud system & project, and instructions on how to use the system, can be found at www.c3-cloud.eu/training/swft/patientsandcarers

2. RJH



För att komma åt C-3 Cloud loggar du in på

<https://c3cloud-pep.regionjh.se>

Informationsmaterial om C3-Cloud och hur det används finns på

www.regionjh.se/c3info

**Om du har frågor rörande din vårdplan kontaktar du din
vårdpersonal.**

Har du problem att få C3-Cloud att fungera kan du kontakta

malin.carlsson@regionjh.se

3. BC



Por favor, utilice el sistema C3-Cloud para acceder a su plan de atención personalizado y a la información y servicios de apoyo
<https://micarpetasalud.osakidetza.net/b65CarpetaSaludWar/login/inicio>

Puede encontrar más información sobre el sistema C3-Cloud en el enlace privado de la página web de C3-Cloud (<http://c3-cloud.eu/formación/osakidetza/pacientesycuidadores>)

Si tiene alguna pregunta sobre su plan de atención personalizado o necesita ayuda para acceder a él o utilizarlo, contacte con el equipo local de la intervención
(MARIAREMEDIOS.VEGAINIGO@osakidetza.eus)



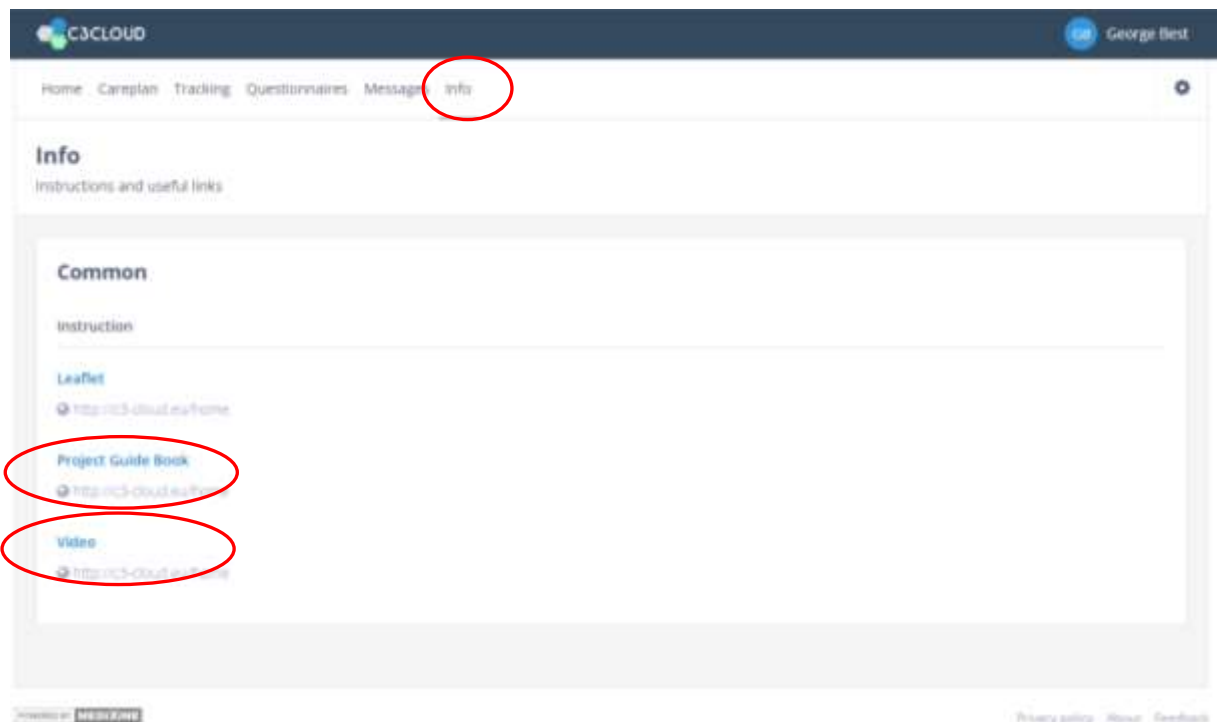
Appendix 6 - C3-Cloud Project Guide Book for Patients and carers

1. PURPOSE OF THIS DOCUMENT

The purpose of the Project Guide Book is to make sure that you (and anyone that is supporting you) are fully prepared for taking part in the C3-Cloud study. This book will help you to gain a better understanding of the study and your role within it. It will explain how your experience with the C3-Cloud system will be assessed, what you will be asked to do and when it will happen.

This document will supplement the information that you are given at (i) the introductory workshop and (ii) the instructions provided on how to use the C3-Cloud system in the user manual and the on-line video tutorial. These training materials can be accessed as follows:

- From the C3-Cloud project website by clicking the following links in each pilot:
 - SWFT: <http://137.205.175.63/c3-cloud/training/swft/patientsandcarers>
 - RJH: <http://c3-cloud.eu/traning/rjh/Patienterochanhoriga>
 - BC: <http://c3-cloud.eu/formacion/osakidetza/pacientesycuidadores>
- From the “Info” Section in the C3-Cloud system, as it is shown below.
- From the local website, only for RJH: www.regionjh.se/c3info



Please take the time to read the user manual and watch the video tutorial as it will really help you when using the system. You can go back and watch it at any time before and during the study

2. BACKGROUND TO, AND ROLE OF THE PATIENT IN C3-CLOUD STUDY

As people get older, they are more likely to suffer with more than one long term illness. These illnesses can be complex and require careful management. Coping with these illnesses can be very difficult for patients and can bring challenges for healthcare service providers including GPs, hospitals, etc.

In response to these challenges, the C3-Cloud pilot study will look at whether the new C3-Cloud computer system can help to improve the care of patients aged 55 & over who have more than one long term illness. In this case we will be looking at its usefulness for patients with 2 or more of the following long-term illnesses - diabetes type 2, mild to moderate heart failure, moderate renal (kidney) failure or mild to moderate depression.

The C3-Cloud system is designed so that patients can work more closely with their healthcare professionals, e.g. doctors and nurses, and will encourage patients to be more actively involved in their care process. The system allows patients to create, develop and manage their personal care plans with their healthcare professionals and to provide updates on their care plan through the patient 'empowerment' mechanisms provided by the system.

C3-Cloud will encourage **patient centred care**. The care plans will be personalized for each individual patient taking into account the patient's overall health status, their views, wishes, goals and preferences. The **personalized care plan** of the patient will be shared, carried out and revised by all of the professionals that are involved with the patient's care process.

C3-Cloud aims to ensure that patient needs are respected in **decision making**, that patient preferences are expressed and that each patient is encouraged to practice **self-management**. **Patient empowerment and education** are key factors to ensure the active participation of the patients in the management of their conditions.

You can find more information in the C3-Cloud introductory video entitled 'Working together for your health: a strategy for success' which you can watch by clicking the following link. This video can be accessed as follows:

- From You Tube, by clicking the following links in each pilot:
 - SWFT: <https://youtu.be/DE-GbYqXDSc>
 - RJH: <https://youtu.be/f5qqQxYOeBE>
 - BC: <https://www.youtube.com/watch?v=V9bTjVQgRoM>
- From the C3-Cloud website by clicking the following links, in each pilot:
 - SWFT: <http://137.205.175.63/c3-cloud/training/swft/patientsandcarers>.
 - RJH: <http://c3-cloud.eu/traning/rjh/Patienterochanhoriga>
 - BC: <http://c3-cloud.eu/formacion/osakidetza/pacientesycuidadores>
- From the "Info" Section in the C3-Cloud system itself, as shown by the red circle in the screenshot below (needs to be updated when the materials are available in the system).



As a patient who is participating in the study your main role will be to use the C3-Cloud system during the study as part of your healthcare journey. This will be done in conjunction with your healthcare professionals. You will also be asked to provide us with some feedback on your experience with the system at different stages of the project and this is explained in Section 4.

3. DESIGN OF THE STUDY

C3-Cloud is a 4 year research project which is funded by the European Commission. The project has developed a new computer system called 'C3-Cloud' which is being tested with patients and healthcare professionals in the UK, Sweden and Spain.

The study will assess the usefulness and user-friendliness of the new C3-Cloud system which is designed to improve the care of patients with multiple long term illnesses. The overall issue is whether the C3-Cloud system, which aims to facilitate coordinated care, optimization of treatment and patient self-care, is useful for patients with multiple chronic diseases and for their team of healthcare professionals.

There are 2 parts to the C3-Cloud system which are inter-linked and share information. One is used by the patients and the other is used by healthcare professionals, e.g. doctors, nurses, physiotherapists, etc.

The patients participating in the C3-Cloud study are 55+ and have at least two among these four chronic diseases: diabetes type 2, mild to moderate heart failure, moderate renal (kidney) failure or mild to moderate depression.



C3-Cloud multimorbid patient:



The patients such as yourself, along with the healthcare professionals that have been recruited to the study, will use the C3-Cloud system over the study period as part of the care process. The patients will have a care plan created on the C3-Cloud system that they will develop and manage with their healthcare professionals during the study.

The project will assess the usefulness and user-friendliness of the system with patients and healthcare professionals during and after the end of the study through a series of questionnaires, as described in Section 4 of this document.

The project will also compare the care and treatment received by patients that have used the system and those that have not by comparing your experience with the experience of similar patients whose data will be retrieved anonymously from the local healthcare systems. The impact of C3-Cloud on the care process will be assessed by looking at the use of resources and medication across both groups of patients.

4. TAKING PART IN THE STUDY

As you know, you will use the C3-Cloud system in conjunction with the healthcare professionals that are treating you during your healthcare journey. You will have access to, and contribute to, the design of your personal health care plan but will also help us to assess the C3-Cloud system.

You will need to use an internet-connected device such as computer, tablet, or mobile phone from time to time to do this. If you need help and support with using the system you can give permission for other people such as your partner, children, carers, etc. to access your care plan with/for you in the C3-Cloud system.

When you have contact with your doctor or nurse for the first time during the study, you will agree (or re-confirm) your care plan with them, and this will be entered into the system. This might include setting some goals and activities with you. It might also involve offering you some of the educational information that is available in the system to help you to better understand your condition or treatment. It is possible that this first visit may be slightly longer than a normal consultation. You can find more information about the training/educational materials and resources that might be made available to you in the C3-Cloud system at Annex 1 of this document.

Once your care plan is prepared, you will be given access to the C3-Cloud system so that you can view and update your care plan whenever you wish. You will also be able to send messages and updates to your care team members, as agreed, via the system. Instructions on how to use the C3-Cloud system are described in the C3-Cloud User Manual.

Each time you visit a healthcare professional that is taking part in the study, e.g. your GP, your care plan in the C3-Cloud system will be reviewed with you. Before the start of the study you will have been given a small C3-Cloud card to put in your purse/wallet so please show this to any healthcare professionals that you see so that they are aware that you are taking part in the study. If the healthcare professional is also taking part, they will use the C3-Cloud system during your consultation. It is not expected that you will need to make additional visits for the purpose of the study unless this is felt necessary by your healthcare professional.

In Sweden some participants will also test Blood Pressure measurers and weight scales integrated with C3-Cloud. A personal contact will be taken if you will be invited to this part of the C3-Cloud test.

Please note that not all healthcare professionals that you will see during the study will actually be taking part in the study. This is because it was not possible to recruit and train every healthcare professional that you might see and also because the project has only recruited healthcare professionals who are likely to be involved with treating the 4 diseases, i.e. diabetes type 2, heart failure, kidney failure and depression.

Please also be aware that any healthcare professionals taking part in the study will use the C3-Cloud system alongside any computer systems or paper records which they normally use. This is because the C3-Cloud system is only in the test phase at the moment. **Therefore, it is very important that you do not rely solely on the information in the C3-Cloud system. Please continue to use the information that is provided to you through normal channels such as appointment letters or instructions from the hospital or your GP.**

Finally, please take into account that after the study period, the system will not be available to you. The current C3-Cloud system is the result of a research project and it will be tested during the study. It will need further improvements according to the experience and feedback gained during the study. Depending on the outcome of the evaluation, it is possible that the C3-Cloud system will be offered for use in the future.

5. PATIENT EVALUATION OF THE C3-CLOUD SYSTEM

Patient experience and feedback is key for the improvement of the C3-Cloud system. You, as a patient, will be asked to provide us with some feedback on your experience with the system at different stages of the study. The following evaluation activities will take place during the study.

The usefulness and user friendliness of the C3-Cloud system will be assessed using the feedback that you provide in a series of questionnaires. The questionnaires are completely anonymous and will not contain any information that will identify you.

While we ask you for an indication of your age range, your sex and the region you live in, but otherwise the questionnaires remain completely anonymous. We are also not able to trace the questionnaire back to your computer. Analyzing these questionnaires will allow the researchers to evaluate the impact that the C3-Cloud system has had on the patients who have used it. The questionnaires cover aspects such as: the usability and acceptability of the C3-Cloud system; the use and usefulness of the training materials; and your satisfaction with the C3-Cloud system.

All surveys show an automatic message explaining that the questionnaires are treated anonymously and informing participants that the questionnaires cannot be traced back to individuals.

What questionnaires will you be asked to complete and when?

During the study, you will be asked to complete the following 3 questionnaires. Responses will be requested approximately five working days after the questions are sent to the patients

Questionnaire name	Purpose of the questionnaire	Number of Questions	Estimated Time Effort to Complete	Date of Activity & Time Allowed for Completion
UTAUT Patient [First part] (Unified Theory of Acceptance and Use of Technology)	To evaluate acceptance and use of the new technology C3-Cloud	19	5 minutes	May 2019
eCCIS Patients (eCare Patient&Carer Impact Survey)	To evaluate the impact of the C3-Cloud application on the patients	22	6 minutes	January 2020
UTAUT Patients [Second part] (Unified Theory of Acceptance and Use of Technology)	To evaluate acceptance and use of the new technology C3-Cloud	21	5 minutes	January 2020

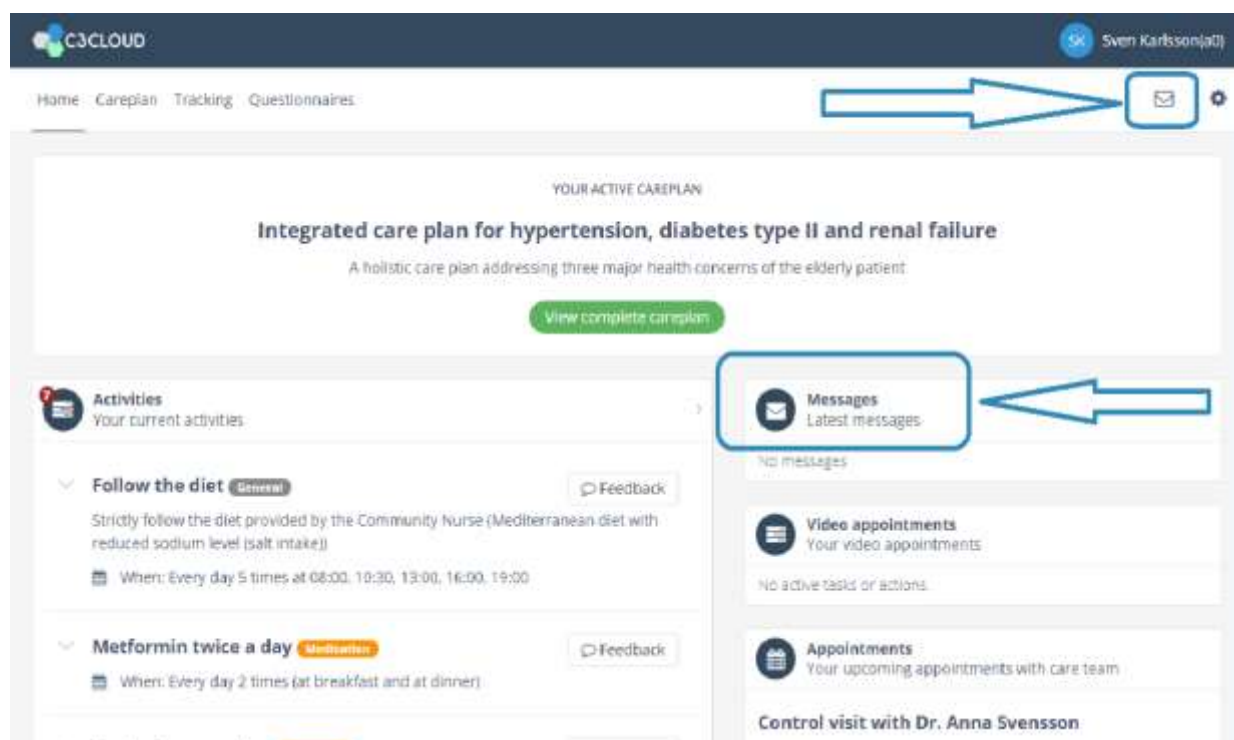
Also, you may be one of 50 patients who is selected at random to complete the 6 additional questionnaires below.

Questionnaire name	Purpose of the questionnaire	Number of Questions	Estimated Time Effort to Complete	Date of Activity & Time Allowed for Completion
Patient Questionnaire [First part]	To evaluate the impact of the C3-Cloud implementation on patients	4	2 minutes	May 2019
QUIS7 [First part] (Questionnaire for User Interaction Satisfaction)	To assess the user's subjective satisfaction with human-computer interfaces	19	3	May 2019
Patient Training Materials [First part]	To evaluate the training materials that can be assigned to patients through C3-Cloud System	16	4 minutes	May 2019
Patient Questionnaire [Second part]	To evaluate the impact of C3-Cloud implementation on patients	13	3 minutes	January 2020
QUIS7 [Second part] (Questionnaire for User Interaction Satisfaction)	To assess the user's subjective satisfaction with human-computer interfaces	64	10 minutes	January 2020
Patient Training Materials [Second part]	To evaluate whether the training materials were used and how frequently.	9	3 minutes	January 2020

How will I access and complete the questionnaires?

Instructions for completing the questionnaires are shown below. The questionnaires will be completed in an external system using an internet survey system called 'LimeSurvey' that is hosted by the C3-Cloud partner "empirica" in Germany.

You will receive a request to complete a questionnaire at the agreed time through the C3-Cloud system messaging itself. You will see this request when you log into the C3-Cloud system as shown in the picture below. In addition, if you have provided the study team with an email address during your enrolment into the C3-Cloud study, you will also receive an email notifying that you have received a message in the C3-Cloud system. You can ask someone to help you with completing the questionnaires if needed, e.g. friend, partner, carer.



When you open the request to complete a questionnaire in the C3-Cloud system you will see a message similar to the following example:-

Dear patient,

You have been invited to participate in one of the surveys during the C3-Cloud project.

This survey is titled „C3-Cloud patient questionnaire (at the beginning of the study)“.

It will take you through a series of questions about your satisfaction and acceptability of the C3-Cloud System and the training material that you have seen or received.

To start the survey on your internet browser, please click on the link below.

Sincerely,

Your C3-Cloud project team.

Click here to start the survey:

<http://surveys.empirica.biz/index.php/792139?newtest=Y&lang=en>

To complete the questionnaire please click the link in your message. This will open your internet browser and take you to a summary page similar to the one below, where you will see a description of the questionnaire content, roughly how much time it will take to complete the questionnaire and some instructions about how to save and resume the questionnaire. The exact layout and description may differ from the pictures below.

By clicking the link, you will be directed to a questionnaire specifically designed to obtain your feedback on the C3-Cloud platform (see screenshot below).

What kind of questions will I see?

There are different kinds of questions and different ways to answer these.

For some questions you will be asked to select your choice on a scale of 0-9:

Or you may be asked to use a slider to indicate your answer:

You may also be asked to select your choice on a scale from “Strongly agree” to “Strongly disagree” (see below):

	Strongly disagree	Very much disagree	Disagree	Not sure	Agree	Very much agree	Strongly agree	The question is not relevant to me	No answer
The manual is comprehensive enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
The use of PEP is smooth (no technical errors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
The steps followed by the system are logical to use, apply, and recall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
There is technical support available if I need it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
When I get stuck, a sufficient resource will be available to help me out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Next

Finally, you may be asked to type a short text answer in boxes similar to the one below:

Do you have any additional comments?

Next

Can I complete the questionnaire in stages?

You do not have to complete the questionnaire in one go. You can pause it and resume it at any time for your convenience. You will have the option of saving the answers that you have already given or deleting them so you can start again from scratch, as follows.

To delete answers entered up to that moment and start again, click the “Exit and Clear Survey” button on the upper right hand corner of the page (as per the picture below).

Closure QUIZ?
Resume later Exit and clear survey

Part 1: Overall reaction to the C3-Cloud system.

Please select the numbers, which most appropriately reflect your impressions about using this computer system.

If a question is not relevant to you, you can choose N/A=Not Applicable.

Alternatively, you can save the answers that you have given and come back to them later by clicking on the “Resume later” button (as per the picture above). By clicking on the “Resume later” button, you will be asked to enter a name and chose a password. An email address is not required – however if you enter an email address it will only be used to automatically send a hyperlink directly to your email,

which allows you resume completing the questionnaire at a more convenient time. When you have entered the information (see below) your progress will be saved.

Save your unfinished survey

Enter a name and password for this survey and click save below.
Your survey will be saved using that name and password, and can be completed later by logging in with the same name and password.

If you give an email address, an email containing the details will be sent to you.

After having clicked the save button you can either close this browser window or continue filling out the survey.

To remain anonymous please use a pseudonym as your username, also an email address is not required.

Name:

Password:

Repeat password:

Your email address:

[Save now](#)

[Return to survey](#)

You may click the survey web-link that you originally received through the C3-Cloud messaging system to “Load your unfinished survey”. Enter the user name you created above to resume the questionnaire from where you saved it:

Load a previously saved survey

You can load a survey that you have previously saved from this screen.
Type in the 'name' you used to save the survey, and the password.

Saved name:

Password:

[Load now](#)

[Return to survey](#)

[Load unfinished survey](#) [Exit and clear survey](#)

An email (see below) with your user name, password and a link to load and resume your unfinished survey will only be sent to you if you indicated your email earlier. This is not required! If you choose

not to give your email address, you will only need to remember your user name and your password yourself. Please note: For your own privacy, we do not know what these details are and cannot retrieve either of them for you.



When will I need to complete the questionnaires?

- May 2019:
 - UTAUT Patient [First part]
 - Patient Questionnaire [First part]
 - QUIS7 [First part]
 - Patient Training Materials [First part]
- January 2020:
 - eCCIS Patients
 - UTAUT Patients [Second part]
 - Patient Questionnaire [Second part]
 - QUIS7 [Second part]
 - Patient Training Materials [Second part]

What do I do if I have problems accessing or completing the questionnaires?

The sections below give you guidance on what to do, or who to contact, if you encounter certain situations.

What if I forget my survey password?

Go to your log in page through the link you receive in the message, click on “Forgot your password”. If you have entered an email address (as explained in section above), you will also receive the link in your email inbox. For a new password you need to enter your username and original email address that you defined when first clicking “resume later” on the LimeSurvey. LimeSurvey will set you a new password and send the password to you by email.

What if I cannot access the survey form online

If you are having problems with accessing the questionnaires, please contact:

- SWFT: either the C3-Cloud evaluation team (malte.vontottleben@empirica.com) or your local C3-Cloud project team contact (see Section “Who to contact for help” below).
- RJH: See Section “Who to contact for help” below.
- BC: See Section “Who to contact for help” below.

What if I need help to complete the form?

Generally, we hope that you will be able to answer the questions all by yourself. However, informal caregivers (family members, friends etc.) are welcome to assist you if help is needed. You can also contact the members of the local team. Contact details are shown in Section “Who to contact for help” below.

What if I have more questions?

In case you encounter any unexpected errors in the questionnaire system or if you have any more questions regarding LimeSurvey, please contact:

- SWFT: either the C3-Cloud Evaluation Team (malte.vontottleben@empirica.com), or your local C3-Cloud project contact (Section “Who to contact for help” below).
- RJH: See Section “Who to contact for help” below.
- BC: See Section “Who to contact for help” below.

6. WHO TO CONTACT FOR HELP

If you encounter any problems with the C3-Cloud system please contact Local Helpdesk:

- SWFT: details TBC
- RJH: malin.carlsson@regionjh.se
- BC: MARIAREMEDIOS.VEGAINIGO@osakidetza.eus

If you need help with using the C3-Cloud system, or if you are concerned about anything in the project, please contact Local C3-Cloud Project Team:

- SWFT: details TBC
- RJH: malin.carlsson@regionjh.se
- BC: MARIAREMEDIOS.VEGAINIGO@osakidetza.eus

If you have any problems accessing the questionnaires online, if you find any unexpected errors in the questionnaire system or if you have any more questions, please contact:

- SWFT: malte.vontottleben@empirica.com
- RJH: malin.carlsson@regionjh.se
- BC: MARIAREMEDIOS.VEGAINIGO@osakidetza.eus

7. PROTECTING YOUR INFORMATION

Having given your consent, project staff at each pilot site (SWFT/RJH/BC) will use your name, and contact details to contact you about the research study, and to make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study.

Individuals from each pilot site and regulatory organisations may look at your medical and research records to check the accuracy of the research study, to audit the data collection process and to organise study activities.

Staff at each pilot site will collect information about you for this research study from your healthcare records, from any questionnaires that you are asked to complete, and from yourself when you are using the C3-Cloud system.

This information will include your name, other identifiers from your healthcare records, contact details and health information, which is regarded as a special category of information. We will use this information to care for you during the study and to analyse the effects of the C3-Cloud system.

Identifiable information that is collected about you in the C3-Cloud system will be accessible to health professionals from each pilot site who are involved in the study, but your record will only be accessed by those that are directly involved in your care.

The local project team, and staff who are responsible for fixing bugs in the system, may also need to access your information in the system from time to time.

The researchers who will analyse your information will not be able to identify you and will not be able to find out your name, any other identifiers or your contact details. You will not be identified in any publications resulting from the study.

Anyone who has access to your information as part of the study will have signed confidential agreements.

8. ANNEX 1: GUIDE TO EDUCATIONAL/TRAINING MATERIALS IN C3-Cloud

As you know, one of **the aims** of the **C3-Cloud** study is to help you, and anyone that cares for you, to **better understand your illnesses** and **how they are treated**. We hope that by doing so that we can help you to be more actively involved in managing your conditions and your day to day care.

In support of this, **the C3-Cloud System** can provide you with access to a range of **information** and **training guides** from tried and tested sources, e.g. details about your illnesses, what caused them, what the symptoms are, how they are treated, and what you can do to help yourself, e.g. diet, exercise, taking medication correctly etc. Your doctor or nurse will help you to identify the information that is most relevant to you during the study.

This Guide has been put together to explain to you what training and educational materials are available to you and how you and the people that care for you can access and use them.

What Information is Available to you?

Below are some of the main information materials that may be made available to you through the C3-Cloud system during the study:-

- I. ***A self-management and multi-morbidity video***, which we recommended that you watch, especially when you first join the study. The video aims to explain the impact of having more than one long term illness to deal with and some of the activities and recommendations that you can carry out to better control your illnesses and their symptoms
- II. ***The core educational materials***, which are generally leaflets or web pages, and typically cover the following topics:-

- Overview of your illness/diagnosis
- Symptoms
- Treatment options, e.g. medicines
- Lifestyle such as diet, exercise, alcohol, smoking, emotional wellbeing

These materials are very easy reading and some of them include videos and audio files or even provide helpful monitoring tools and tips. You will be invited to read some of these materials by your health and care professionals at certain times. For example, you may be given information about a new medication that you are starting on, including how to take it and what the side effects might be, etc., or if one of your targets is to lose weight then you might be given materials about health eating and exercise

- III. ***Information about local support groups or training programmes*** which you could join (where available, and if your health and care providers feels that this is appropriate for you), so that you can share your experiences with people with the same or similar illness(es) and/or get advice
- IV. The C3-Cloud System also gives you the opportunity to use some more interactive materials such as **well-being** and **progress questionnaires**, and in some cases to share information electronically with your health and care professionals, e.g. blood pressure or blood sugar readings.

You can use these materials above alongside any other information that is recommended, or issued, to you by your health and care professionals, e.g. leaflets from your GP surgery or hospital, or even other sources of information that you already use and have found helpful. However, the information in the C3-Cloud System has been specifically pre-selected for you by your health and care professionals as they believe they will be of value to you when following your care plan.

When should you access and use the training/educational materials/information?

Your health and care professionals will allocate relevant information to you through notifications in the C3-Cloud System, in line with your care plan or according to your health concerns or interests at a particular point in time. Alternatively, if you feel you have any specific information or training requirements please discuss what is available with your health and care professional.

You may also **receive notifications** about **carrying out routine tasks** such as submitting blood pressure readings.

Where to Find & Access the information

You can find and access these materials via your Care plan view.

Current tasks

QUESTIONNAIRE
Fagerstrom Test of Nicotine Dependence
When: from 05/11/2018 to 11/11/2018 [Answer](#)

OBSERVATION
Self-measurement of blood pressure
When: from 08/10/2018 to 08/11/2018 [Add new](#)
[Open tracker](#)

Goals (2)
Goals and targets set by your care team.

Activities (4)
Activities and tasks you should do to achieve your goals.

Info (1)
Information and instructions to help you to reach your goals.

[VIEW COMPLETE CAREPLAN](#)

Appointments
Your upcoming C3-Cloud appointments

Appointment for annual control visit
16/07/2019 10:17

Please take some time to open each of them and access the materials at least once. You can open the training/educational materials by clicking on the link(s) provided. Please note that most materials open in a new tab in your internet browser. Below is an example of an information material which might be assigned to you in the C3-Cloud system.

Info
Information and instructions to help you to reach your goals.

Dealing with Hypoglycaemia [↗](#)
<https://patient.info/health/dealing-with-hypoglycaemia-low-blood-sugar>

Can I provide feedback on the information?

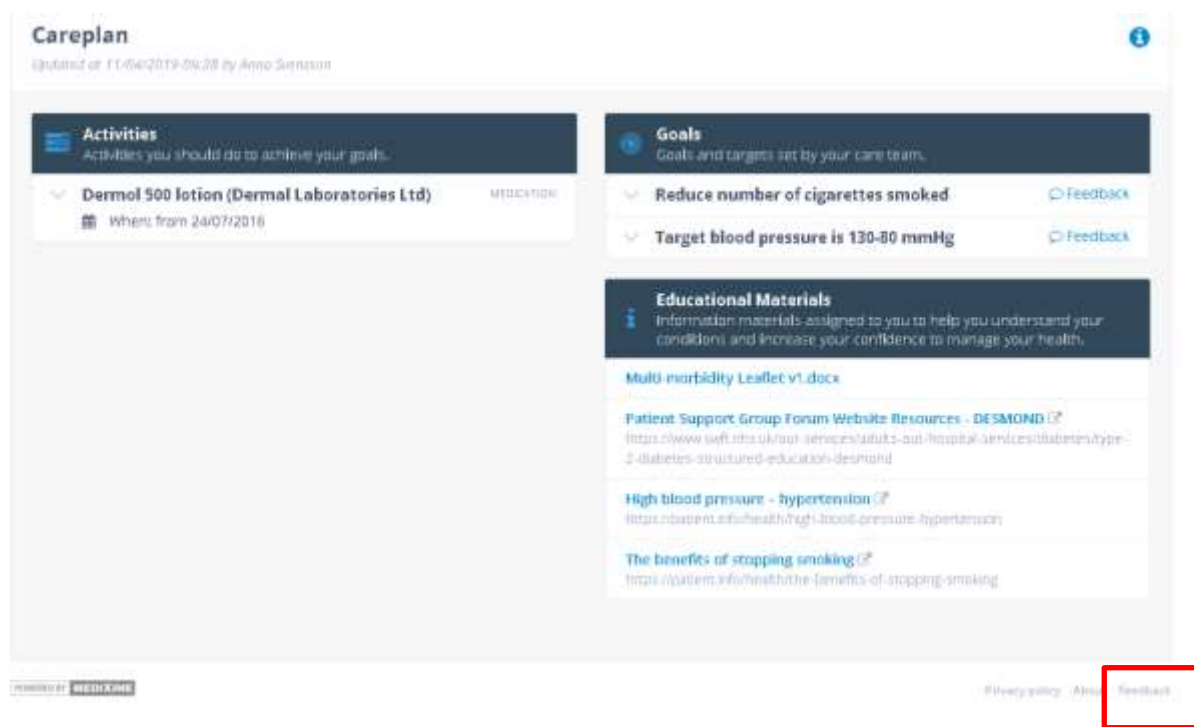
You will not be asked to provide feedback on individual training/educational materials as you use them. However, you will be asked to give us your thoughts on the video, the leaflet and the wallet card shortly

after joining the study. You will also be asked to give us your opinions on the usefulness and quality of the training materials in general at the end of the study.

What if I find an issue with the information or its not working?

If you discover a **problem with** one of the **materials** that has been recommended for you, e.g. a link is not opening up, you can use the general feedback functionality in C3-Cloud to contact us.

You can access the feedback form in the C3-Cloud system by clicking on the 'Feedback'-link in the page footer at the bottom page of the screen (as per the screenshot below).



This will open up the Feedback screen below.

Feedback

×

Name

Contact info

Email or phone number

Message *

Send

Cancel

Please enter the requested details in the form and press the ‘Send’ button.

You can also contact your local C3-Cloud project team member named in Section “Who to contact for help” above.

Please note that it is very important that you only use these feedback mechanisms to report problems with the training/educational materials and not to report problems with your health or care plan or to get help in emergency situations.

Appendix 7 - C3-Cloud Project Guide Book for Healthcare professionals

1. PURPOSE OF THIS DOCUMENT

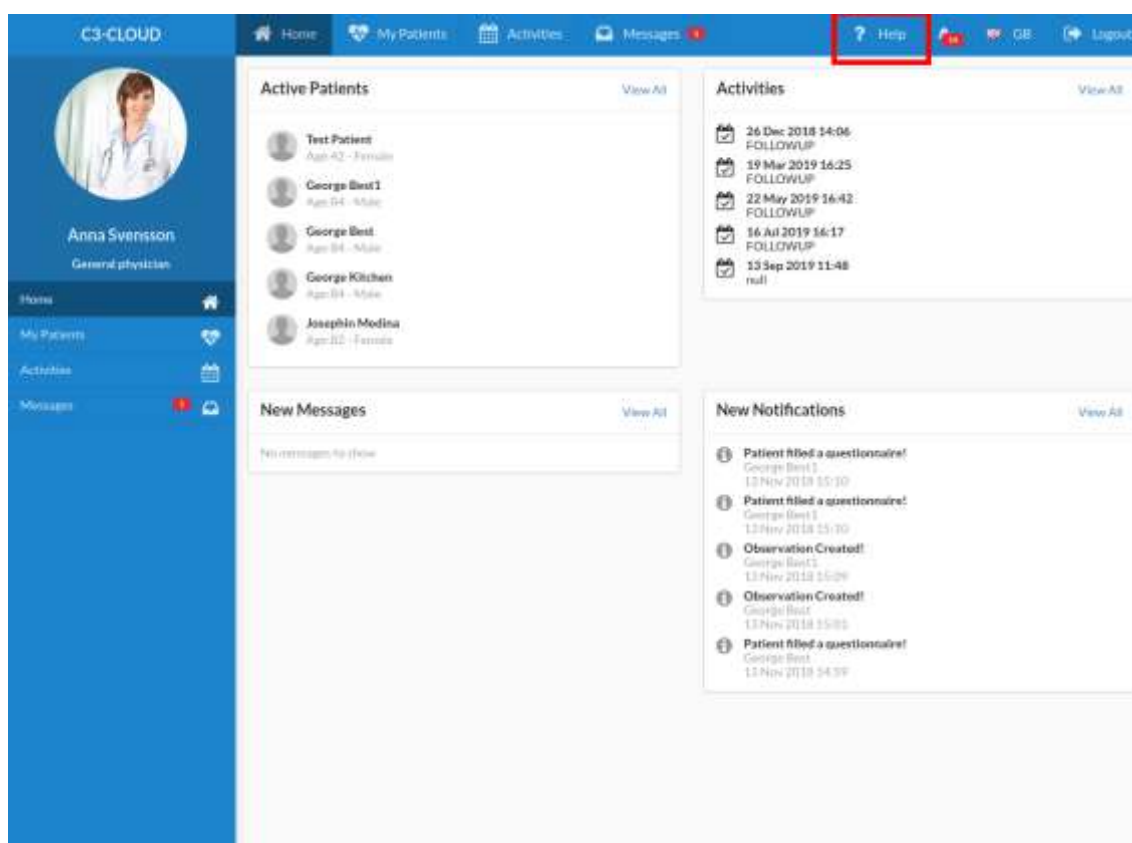
The purpose of the Project Guide is to ensure that you are prepared for your participation in the C3-Cloud study. This document will help you to gain a better understanding of the study and your role within it and also explain how the evaluation of the system will be carried out, including what you will be asked to do and when.

The Guide Book is designed to supplement the formal training that you will receive from the project team and the instructions provided on how to use the C3-Cloud (C3DP) system in (i) the user manual and (ii) the on-line video tutorial. These training materials can be accessed from the C3-Cloud project website by clicking the following links in each pilot site:

- SWFT: <http://c3-cloud.eu/training/swft/healthcareprofessionals>
- RJH: <http://c3-cloud.eu/traning/rjh/halsovardspersonal>
- BC: <http://c3-cloud.eu/formacion/osakidetza/profesionalessanitarios>

In addition, in RJH, they can be accessed from the local website www.regionjh.se/c3info.

You can also download a copy of the training materials from “Help” menu in the C3DP system. Once you log into C3D, click on ‘Help’ tab from the top menu and select the material to access. To download it, click on the download bottom and the training material will be downloaded to your computer.





Please take the time to watch this video as it will really help you when using the system. You can go back and watch it at any time before and during the study.

2. ABBREVIATIONS AND ACRONYMS

Table 1 List of Abbreviations and Acronyms

Abbreviation/ Acronym	DEFINITION
C3DP	Coordinated Care and Cure Delivery Platform
CDS	Clinical Decision Support
GP	General Practitioner
ICT	Information Communication Technology
IT	Information Communication Technology
MDT	Multidisciplinary Care Team
PEP	Patient Empowerment Platform

3. BACKGROUND AND PURPOSE OF THE C3-CLOUD STUDY

Older people are more likely to suffer from multiple chronic conditions – ‘multi-morbidity’ - including a number of functional and cognitive impairments. Multi-morbidity creates diverse and sometimes contradictory needs that challenge patients and the delivery of health services.

The clinical management of patients with multi-morbidity is much more complex and time-consuming than management of those with single diseases. Currently those with chronic conditions and long-term care needs experience shortcomings and gaps in care provision. Achieving good quality integrated care is a recognised difficulty in many health care systems.

There is an increasing need to organise the care around the patient and not the disease, taking into account his or her multiple physical and psycho-social conditions. So, the fundamental question addressed by the study is “How can we effectively care for and support elderly patients with multi-morbidity needs?”

The C3-Cloud project is a joint European effort for the development of new and better computer systems to improve the care of the elderly with multiple chronic conditions. C3-Cloud aims to bring together key information in a single system to encourage improved co-ordination of patient-centered care activities by a multidisciplinary care team.

The purpose is to make it easier to plan and manage the best treatment from available evidence-based guidelines in order to improve quality of care. It also aims to reduce harmful combinations of medication. An important aspect of the project is to include the patients as users of the new IT system, and informal caregivers where applicable.

The key principles of the project/system are:

- Personalized Care Plans
- Patient Centered Care
- Self-management, Patient Empowerment and education
- Coordinated and collaborative Multidisciplinary Team (MDT)
- Shared decision making

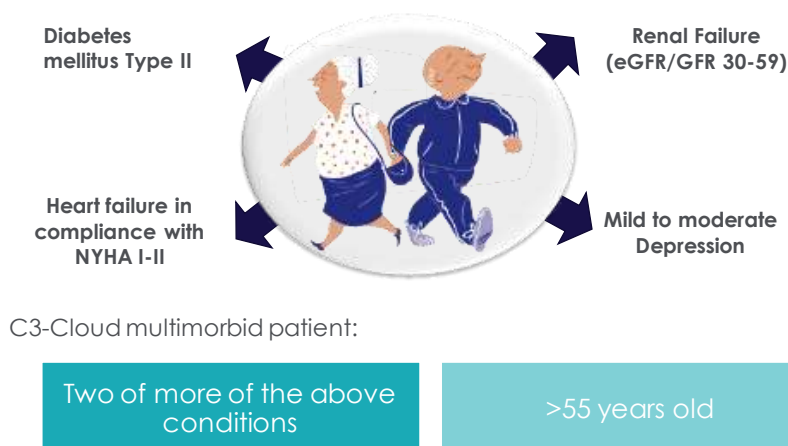
4. DESIGN OF THE STUDY

C3-Cloud is a 4 year research project which is funded by the European Commission. The project has developed a new computer system called 'C3-Cloud' which is being tested with patients and healthcare professionals in the UK, Sweden and Spain.

The research objective is whether the C3-Cloud system is useful for patients with multiple chronic diseases and for their team of healthcare professionals to facilitate coordinated care, optimization of treatment and patient self-care.

There are 2 parts to the C3-Cloud system which are inter-linked. One part is called the 'Patient Empowerment Platform' (PEP) and is used by the patients. The second part is called 'C3DP' and is used by healthcare professionals, e.g. doctors, nurses, physiotherapists, etc.

The patients participating in the C3-Cloud are (55+), having at least two among these four chronic diseases: Diabetes mellitus Type II, Heart failure, Renal failure and mild to moderate Depression.



The patients taking part of the C3-Cloud study will use the C3-Cloud system. Their experience will be compared with data from similar patients retrieved anonymously from the local healthcare systems.

The patients and healthcare professionals that have been recruited to the study will use the C3-Cloud system over the study period as part of the care process. The patients will have a care plan created on the C3-Cloud system that they will develop and manage with their healthcare professionals during the study.

The project will assess the usefulness and user-friendliness of the system with patients and healthcare professionals. The project will also compare the care and treatment received by patients that have used the system and those that have not. The impact of C3-Cloud on the care process will include the monitoring of the use of resources and medication of C3-Cloud patients and local similar patients.

5. MANAGING A PERSONALIZED CARE PLAN IN C3DP

General description

As a healthcare professional that will be taking part in the study, you will use the system while delivering care and treatment to any of the patients in the intervention group of the study. You will use it to create, update and review a personal health care plan with the patient.

You will agree to a care plan or re-confirm an existing care plan with the patient and record it on the C3-Cloud system. Depending on the patient's specific care needs, this might involve setting some goals and activities for the patient. There will be a set of evidence-based guidelines that suggest context specific goals and activities for various issues and information cards that provide textual guidance.

The C3-Cloud system will allow you and the patient to view this personal care plan at any time. The patient may also send feedback, readings, messages, photos etc. to you in between visits, as agreed with you. The care plan may be updated by another healthcare professional who is involved in the patient's care team. The system will inform you when new information is uploaded.

In the next sections you will find an overview of some of the actions that healthcare professionals may need to carry out during initial and follow-up consultations using C3-Cloud. You can keep it on your desk and refer each time you see the patient during the study. Please note that full instructions on how to use the system are included in the C3DP User Manual.

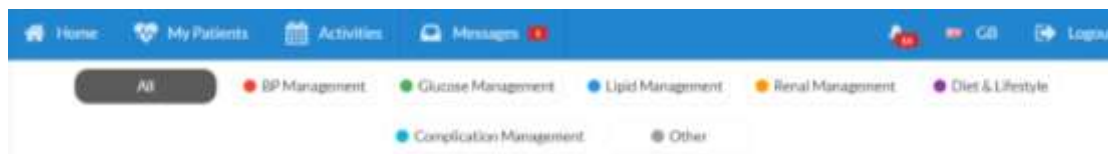
Creating the initial care plan: Initial consultation

If you are the first healthcare professional to see the patient after they have joined the study, you should log into the C3DP system and follow the steps below:

- Log into the C3DP. You are welcomed via the home screen.
- Find the name of the patient for whom the care plan is going to be created for the first time, by using the search bar.
- Check the details of the patient, e.g. their identifiers, contact details, diagnoses etc., plus any other data that has already been imported into the system from the local healthcare systems.
- Confirm that you want to create the care plan for the first time.
- Create the personalized care plan:
 - Review the medical summary which contains all the information of the patient retrieved from the local system.
 - Complete the Care Team Initialization Form and defining the initial care team to create the care plan
- Manage the care plan:
 - If needed, introduce/update some new health data for the patient that is controlled by the Clinical Decision Support (CDS) services and that is not included in his/her medical summary, and save the update.
 - Create goals and activities or assign educational materials (as appropriate) to the patient. These are the main elements of the care plan in C3DP and can be added to the care plan at the discretion of the healthcare professional or may be suggested by the

CDS services. The CDS services are integrated into the system to help the user in the management of the care plan by suggesting creating or cancelling some goals, activities and education materials.

- While creating a care plan for the first time, it is strongly advised to go over each High Level Goal (HLG) assigned to the care plan of the patient and check the goal and activity recommendations by CDS services. In the C3-Cloud system, HLG group goals, activities and education materials, according to the main sub-sections of the chronic disease management clinical guidelines.



- Activities can include medication requests, lab test requests, referral to a specialist, the next planned appointment, patient observations, filling in a questionnaire, etc. Please note that activities such as prescribing, requesting tests and specialist referrals will not be managed in the C3DP system and should be carried out using existing systems/methods.
 - While adding new goals and activities, indicate whether they will be visible to the patient, as some of the goals and activities will only be relevant to the health care professionals.
- Manage the care team, if needed:
 - Access the information of the care team members.
 - You can update the care team by means of adding, removing or editing the members of the care team.
 - Set the date for new Care Plan Review Meeting.
 - Ensure that the patient is fully aware of what they need to do and when to manage their care plan and carry out any goals and activities.
 - Encourage self-management
 - Communicate with other healthcare team members or patients using the messaging module, if needed. You can send messages to patients, care team members or other practitioners to share information.
 - Once the plan has been completed, click the “Publish” button to share it with all the care team members and with the patient. Health care professionals receive a notification in their C3DP account, while patients receive the notification through PEP. Until the care plan is published, it is saved in C3DP in draft form and it is accessible to only the health professionals, not the patients.

The healthcare professional creates a care plan for the patient using information in C3-Cloud that has been brought in automatically from the local patient information systems. e.g. demographics, diagnoses, medications, etc. You will need to check that this information is correct. You will also be able to add other information manually at any time. **The system does not allow data from local health information systems to be overwritten, e.g. if the local system indicates a diabetes diagnosis, it cannot be deleted via C3DP.**

The decision to select specific medicines or other treatment options will continue to be based on your professional judgement and the multi-professional discussion which should also include the patient.

Managing Follow-up consultations

For any subsequent visits you will need to review/update the care plan according to the following instructions:

- After logging in, you are welcomed via the home screen. In this screen you can access navigation menus and information blocks to show the active patients of the user, incoming activities, new messages and notifications.
- Check to see if you have any messages.
- Click on My Patient Tab to see all your patients with care plan listing you as a member of their Care Teams.
- Select the name of the patient and navigate to his/her care plan details or medical summary by clicking on the patient card.
- Manage the care plan:
 - If required, introduce some new health data for the patient. If this is the case, do not forget to click the 'Save' button.
 - According to the current health status of the patient, track and update the progress of patients on assigned goals and activities and educational materials or create new ones. As specific examples, you can:
 - Monitor Patient Observations. You can see all these observations in the activity details by clicking on the activity title.
 - See the answers from the activity details when a questionnaire has been filled in for a questionnaire activity.
- Update the care team membership, if needed.
- Communicate with other care team members, if needed.
- Set the date for next Care Plan Review Meeting.
- Ensure that the patient is fully aware of what they need to do and when to manage their care plan and carry out any goals and activities.
- Encourage self-management.
- Once the plan has been reviewed and updated, the updated plan is automatically shared with all the care team members, including the patients. Health care professionals receive a notification in their C3DP account, while patients receive the notification through PEP.

Important Notes

- **AS THIS SYSTEM IS ONLY IN THE TRIAL PHASE AND HAS NOT YET BEEN VALIDATED IT SHOULD NOT BE RELIED UPON FOR CLINICAL CARE. PLEASE ENSURE THAT IT IS USED ALONGSIDE YOUR NORMAL PROCESSES AND SYSTEMS.**
- Note that activities such as prescribing and specialist referrals will not be managed in the C3DP system and should be carried out using existing methods.
- Take into account that after the study period, the system will not be available to you. This is because the C3-Cloud system will be taken off-line for improvement using the experience and feedback gained from the study. Depending on the outcome of the evaluation, it is possible that the C3-Cloud system will be offered for live operational use in the future.
- Further instructions on how to use the system are given in the accompanying System User Manual.

6. HEALTHCARE PROFESSIONAL EVALUATION OF THE C3-CLOUD SYSTEM

Healthcare professional experience and feedback is key for evaluating and improving the C3-Cloud system. As a member of the multidisciplinary care team, you will be asked to provide us feedback on your experience with the system at different stages of the study. For example: analysis of the feedback that you provide in a couple of surveys will help us evaluate the usability and acceptability of the C3-Cloud system; the use and usefulness of the training materials; and your satisfaction with the C3-Cloud system.

We ask you for an indication of your age range, your sex and the region you live in and the title of your profession, but otherwise your person remains completely anonymous. We are also not able to trace the questionnaire back to your person or your computer.

What Questionnaires will I be asked to complete and when?

During the study, you will be asked to complete the following on-line questionnaires which will be sent to you via the C3DP system at the specified time. Responses will be requested approximately five working days after the questions are sent to you.

The first survey is called “C3-Cloud: First survey for MDTs” and is based on two questionnaires:

- UTAUT (Unified Theory of Acceptance and Use of Technology. Your responses here will help us to evaluate the acceptance and use of the new C3-Cloud system. It contains 20 questions and takes an estimated 5 minutes to complete.
- QUIS7 (Questionnaire on User Interaction Satisfaction). It helps us assess your subjective satisfaction with C3-Cloud software interaction.

This first survey (in May 2019) will contain 39 questions and takes an estimated 8 minutes to complete.

At the end of the trial, we will send you the second survey, which we call “C3-Cloud: Second Survey for MDTs”. This survey contains 147 quick questions and takes an estimated 30 minutes to complete. It is based on several of questionnaires, including

- UTAUT
- QUIS7
- eCUIIS (eCare User Impact Survey)
- A few extra questions for MDTs.

It helps us evaluate your acceptance, utility, satisfaction and the impact of the C3-Cloud system.

Evaluation Activity	Description & Purpose of the Activity	N° of Questions	Estimated Time Effort to Complete	Date of Activity
UTAUT MDT [First part] (Unified Theory of Acceptance and Use of Technology)	The UTAUT questionnaire aims to explain user attitudes towards the application of a new technology and the resulting user behavior	20	5 minutes	May 2019
QUIS7 [First part] (Questionnaire for User Interaction Satisfaction)	The QUIS is a tool to assess the user's subjective satisfaction with C3-Cloud software interaction	19	3 minutes	May 2019
MDT Questionnaire	This questionnaire is to evaluate the impact of C3-Cloud implementation on MDT members	36	9 minutes	January 2020
eCUIIS MDT (eCare Healthcare professional Impact Survey)	The eCUIIS will be used to evaluate the utility that the C3-Cloud application brings to the MDT members	22	6 minutes	January 2020
QUIS7 [Second part] (Questionnaire for User Interaction Satisfaction)	The QUIS is a tool to assess the user's subjective satisfaction with human-computer interfaces	64	10 minutes	January 2020
UTAUT MDT [Second part] (Unified Theory of Acceptance and Use of Technology)	This questionnaire aims to explain user attitudes towards the application of a new technology and the resulting user behavior	25	5 minutes	January 2020

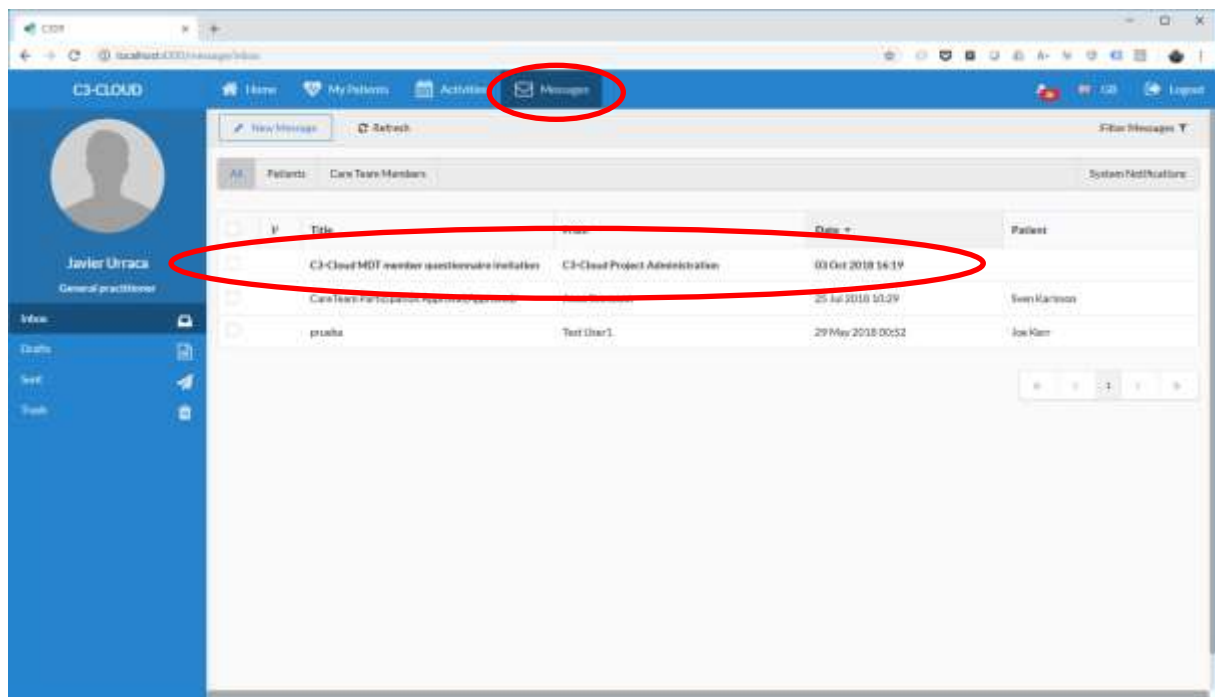
Also, you may be one of 2 healthcare professionals from your region will be selected by convenience sampling to take part in a very short telephone interview (approximately 10 minutes) at the start of the study. This interview is used to investigate two questions:

- How you currently compile and access the patient health data that is needed in order to make informed treatment decisions?
- How do you currently handle contradictory or non-reconciled clinical guidelines in the care planning for multimorbid chronically ill patients?

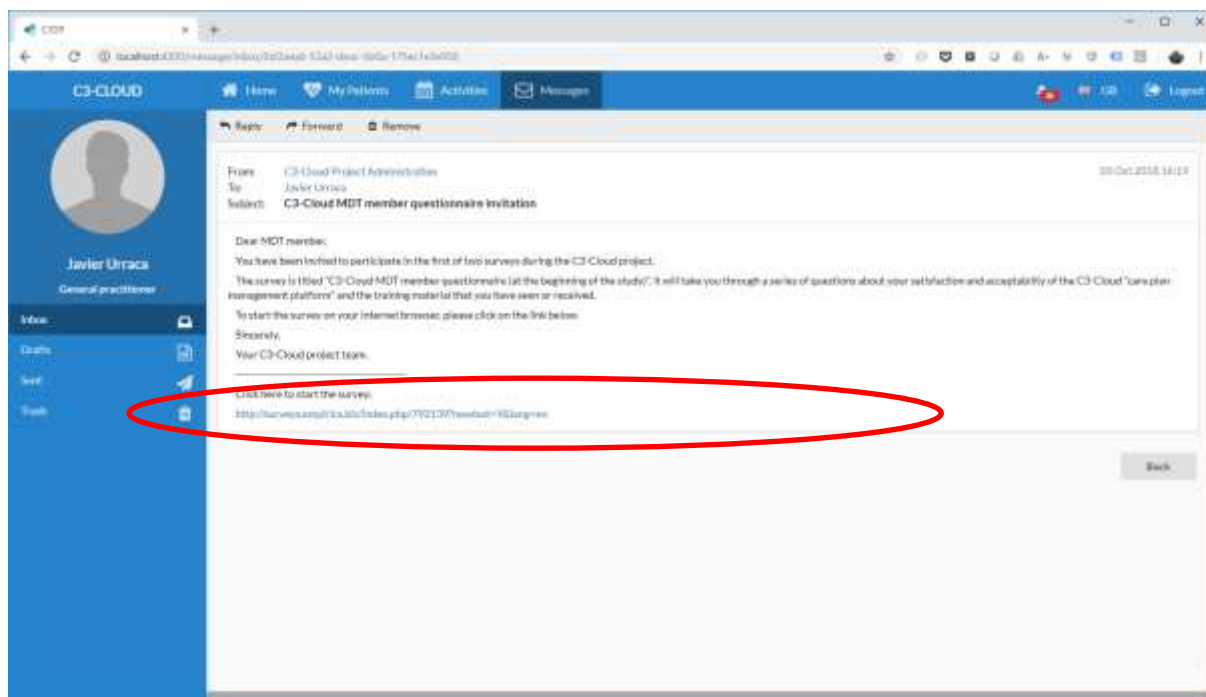
How will I access and complete the questionnaires?

Instructions for completing the questionnaires are shown below. The questionnaires will be completed using an internet survey system called ‘LimeSurvey’, which is hosted by the C3-Cloud partner “empirica”.

You will receive a request to complete the questionnaires at the agreed time through the C3DP messaging system itself. You will see a message, which will show the questionnaire title and a link which will take you to the questionnaire itself, when you log into C3DP as shown in the screenshot below.



When you open the request to complete a questionnaire in the C3-Cloud system you will see a message similar to the following example:



- Text in English for SWFT pilot:

Dear MDT member,

You have been invited to participate in the first of five surveys during the C3-Cloud project.

The survey is titled "C3-Cloud: First survey for members of the multi-disciplinary team". It will take you through a series of questions about your satisfaction and acceptability of the C3-Cloud "care plan management platform" and the training material that you have seen or received.

To start the survey on your internet browser, please click on the link below.

Sincerely,

Your C3-Cloud project team.

Click here to start the survey:

<http://surveys.empirica.biz/index.php/252355?lang=en>

- Text in Swedish for RJH pilot:

Kära medlem i det multidisciplinära vårdteamet,

Du har blivit inbjuden att delta i den första av fem undersökningar under C3-Cloud-projektet.

Undersökningen heter "C3-Cloud: Första undersökningen för medlemmar i det multidisciplinära vårdteamet ". Det kommer att ta dig igenom en rad frågor om din tillfredsställelse och acceptans av C3-Cloud "Plattform för att administrera vårdplanen" och det träningsmaterial som du har sett eller fått.

För att starta enkäten, vänligen klicka på länken nedan.

Vänliga hälsningar,
Ditt C3-Cloud-projektteam.

Klicka här för att starta enkäten:

<http://surveys.empirica.biz/index.php/252355?lang=sv>

- Text in Spanish for BC pilot:

Estimado miembro del Equipo de atención multidisciplinar,

Ha recibido una invitación para participar en el primero de los cinco cuestionarios que le pedimos responder durante el desarrollo del proyecto C3-Cloud.

Este cuestionario se titula "Cuestionario para los miembros del equipo de atención multidisciplinar de C3-Cloud". Le guiará a través de una serie de preguntas sobre su grado de satisfacción y aceptación de la plataforma de gestión de planes de atención C3-Cloud y de los materiales formativos que ha recibido o consultado durante la formación.

Haga clic en el siguiente enlace para responder el cuestionario.

Un cordial saludo,
Su equipo del proyecto C3-Cloud.

Haga clic aquí para responder el cuestionario:

<http://surveys.empirica.biz/index.php/252355?lang=es>

To complete the questionnaire please click the link in your message. This will open your internet browser and take you to a summary page similar to the one below, where you will see a description of the questionnaire content, roughly how much time it will take to complete the questionnaire and some instructions about how to save and resume the questionnaire. The exact layout and description may differ from the pictures below.

By clicking the hyperlink, you will be directed to a questionnaire specifically designed to obtain your feedback on the C3-Cloud system (see screenshots below).

- English version for SWFT pilot:

C3-Cloud: First survey for members of the multi-disciplinary team

Language: English

C3-Cloud: First survey for members of the multi-disciplinary team

Dear C3-Cloud participant,

This survey covers a number of questions about the C3-Cloud platform and the training material. Your input is a very valuable contribution to evaluate the usefulness of the platform.

Please be prepared to spend a total of approximately 14 minutes of your time on this survey. However, you can save your progress anytime during the survey and resume it later by clicking the button on the upper right hand corner of the page and then by following the advised process.

Thank you very much in advance – your C3-Cloud team.

A note on privacy
This survey is anonymous.
The record of your survey responses does not contain any identifying information about you, unless a specific survey question explicitly asked for it. If you used an identifying token to access this survey, please rest assured that this token will not be stored together with your responses. It is stored in a separate database and will only be updated to indicate whether you did (or did not) complete this survey. There is no way of matching identification tokens with survey responses.

Next

- Swedish version for RJH pilot:

Första undersökningen för medlemmar i det multidisciplinära vårdteamet

Språk: Svenska

Första undersökningen för medlemmar i det multidisciplinära vårdteamet

Kära C3-Cloud deltagare,

Denna undersökning täcker ett antal frågor om C3-Cloud-plattformen och träningsmaterialet. Dina svar är ett mycket värdefullt bidrag för att utvärdera plattformens användbarhet.

Undersökningen tar ca. 14 minuter. Du kan spara dina svar och återuppta svaret senare genom att klicka längst på knappen upp till höger på sidan och därefter följa anvisningarna.

Tack på förhand - Ditt C3-Cloud-team.

En kommentar om sekretess
Den här enkäten är anonym.
Ditt deltagande i denna enkät kommer inte innehålla någon identifierande information om dig, om inte någon specifik fråga i enkäten uttryckligen frågar om det. Om du anger en behörighetstoken för att komma in i denna enkät kommer den inte att sparas med dina svar. Behörighetstokenna lagras i en separat databas och kommer endast att uppdateras för att visa om du fyllt ut eller inte fyllt ut den enkät. Det finns inget sätt att koppla behörighetstokenna till svaren.

Nästa

- Spanish version for BC pilot:

C3-Cloud: Primera encuesta para los miembros del equipo multidisciplinario

Cargar encuesta en pantallaSalir y borrar la encuesta

InicioEquipo

C3-Cloud: Primera encuesta para los miembros del equipo multidisciplinario

Estimado participante de C3-Cloud:
Este cuestionario incluye una serie de preguntas sobre la plataforma C3-Cloud y el material de formación. Su aportación es fundamental para evaluar la utilidad de la plataforma.
Por favor, tenga en cuenta que necesitará unos 14 minutos de su tiempo para poder contestar el cuestionario. Siempre que lo desee, puede guardar sus respuestas y reanudar el cuestionario más tarde, en otro momento. Para ello haga clic en el botón de la esquina superior derecha de la página "Cargar encuesta sin terminar" y después continúe con el proceso tal y como se le ha indicado.

Muchas gracias-su equipo de C3-Cloud



Una nota sobre privacidad:
Esta encuesta es anónima.
El registro de su respuesta en la encuesta no contiene ninguna información de identificación sobre usted, ni sé si una pregunta específica de la encuesta lo requiere. Si usted usa clave para acceder a esta encuesta, por favor asegúrese de que no sea guardada con sus respuestas. Esta contraseña será administrada en una base de datos diferente a la encuesta y sólo será utilizada para indicar su participación a la encuesta. No existe ninguna forma de identificar las respuestas de la encuesta a partir de la clave.

Siguiente

Once you have finished reading the information, click the “Next” button to enter the first page of the questionnaire where you will be asked to answer a series of questions.

What kind of questions will I see?

There are different kinds of questions and different ways to answer these.

For some questions you will be asked to select your choice on a scale of 0-9:

- English version for SWFT pilot:

I find the C3-Cloud system:

0123456789N/A

TerribleWonderful

- Swedish version for RJH pilot:

Bokstäverna på datorskärmen är:

0123456789

SvåråästaLättåästa

D9.4 Version 1.0, dated 30 April 2019

Page 125 of 349

- Spanish version for BC pilot:

Los caracteres en la pantalla del ordenador son...

	0	1	2	3	4	5	6	7	8	9	
Difficiles de leer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fáciles de leer

You may also be asked to select your choice on a scale from “Strongly agree” to “Strongly disagree” (see below):

- English version for SWFT pilot:

	Strongly disagree	Very much disagree	Disagree	Not sure	Agree	Very much agree	Strongly agree	This question is not relevant to me	No answer
The manual is comprehensive enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
The use of PEP is smooth (no technical errors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
The steps followed by the system are logical to use, apply, and recall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
There is technical support available if I need it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
When I get stuck, a sufficient resource will be available to help me out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Next

- Swedish version for RJH pilot:

	Håller absolut inte med	Håller till största del inte med	Håller inte med	Vet inte	Håller med	Håller mycket med	Håller absolut med
Jag tror att C3-Cloud är användbart i mitt jobb	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Genom att använda C3-Cloud skulle jag kunna slutföra arbetsuppgifter snabbare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Att använda C3-Cloud skulle kunna öka min produktivitet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Att använda C3-Cloud skulle kunna öka kvalitén i mitt arbete	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sammanfataget skulle C3-Cloud passa bra med hur jag jobbar och med den service jag tillhandahåller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Spanish version for BC pilot:

	No estoy nada de acuerdo	Estoy muy poco de acuerdo	No estoy de acuerdo	No estoy seguro/a	Estoy de acuerdo	Estoy muy de acuerdo	Estoy totalmente de acuerdo
La plataforma de atención y cuidados coordinados C3DP podría ser útil en mi trabajo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
La utilización de la C3DP podría ayudarme a completar mis tareas con mayor rapidez	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
El uso de la C3DP aumentaría mi productividad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
El uso de la C3DP mejoraría la calidad de mi trabajo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
En general, la C3DP podría encajar bien con cómo trabajo y con el servicio que proporciono	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Finally, you may be asked to type a short text answer in boxes similar to the one below:

- English version for SWFT pilot:

Do you have any additional comments?

[Next](#)

- Swedish version for RJH pilot:

Har du några ytterligare kommentarer?

- Spanish version for BC pilot:

¿Tiene algún comentario adicional?

Do I have to complete the questionnaire in one go?

You do not have to complete the questionnaire in one go. You can pause it and resume it at any time of your convenience. You have the option of saving the answers that you have already given or deleting them so you can start again from scratch, as follows:

To delete answers entered up to that moment and start again, click the “Exit and Clear Survey” button on the upper right hand corner of the page (as per the picture below).

- English version for SWFT pilot:

9%

Language: English

Please **select** the choice you think most appropriately reflect your impression about your health condition.
Simply choose “No answer” if you prefer not to answer a question.

- Swedish version for RJH pilot:

9%

Spåk: Svenska

Välj de val du tycker mest avspeglar ditt intryck om ditt hälsotillstånd.
Lämnar ett val helt enkelt obesvarat om du föredrar att inte svara på det.

- Spanish version for BC pilot:

9%

Idioma: Español

Por favor, **seleccione** las opciones que considere más apropiadas para reflejar su impresión sobre su estado de salud.
Deje una opción simplemente sin respuesta si prefiere no contestarla.

Alternatively, you can save the answers that you have given and come back to them later by clicking on the “Resume later” button (as per the picture above). By clicking on the “Resume later” button, you will be asked to enter a name and chose a password. An email address is not required – however if you enter an email address, it will only be used to automatically send you a hyperlink directly to your email which allows you resuming your questionnaire conveniently. When you have entered the information (see below) your progress will be saved.

- English version for SWFT pilot:

C3-Cloud: First survey for patients Resume later Exit and clear survey

Save your unfinished survey

Enter a name and password for this survey and click save below.
Your survey will be saved using that name and password, and can be completed later by logging in with the same name and password.

If you give an email address, an email containing the details will be sent to you.

After having clicked the save button you can either close this browser window or continue filling out the survey.
To remain anonymous please use a pseudonym as your username, also an email address is not required.

Name:

Password:

Repeat password:

Your email address:

[Return to survey](#)

- Swedish version for RJH pilot:

C3-Cloud: Första undersökningen för patienter Fortsätta senare Avbryt och rensa svar

Spara din oavslutade enkät

Lösenorden stämmer inte överens.

Fyll i ett namn och lösenord för denna enkät och klicka spara nedan.
Din enkät kommer att sparas med detta namn och lösenord och du kan senare fortsätta fylla i den genom att logga in med samma namn och lösenord.

Om du anger en e-postadress kommer ett meddelande med dina uppgifter att skickas till dig.

Efter att ha klickat på knappen Spara kan du antingen stänga webbläsarfönstret eller fortsätta fylla i enkäten.

För att fortsätta vara anonym, vänligen använd en pseudonym som användarnamn. Du behöver inte heller ange en e-postadress.

Namn:

Lösenord:

Upprepa lösenord:

Din e-postadress:

[Tillbaka till formuläret](#)

- Spanish version for BC pilot:

C3-Cloud: Primera encuesta para pacientes Continuar después Salir y borrar la encuesta

Guardar su encuesta incompleta

Introduzca un nombre y una contraseña para esta encuesta y pulse "Guardar".
 Su encuesta se guardará con ese nombre y contraseña, y la podrá completar posteriormente ingresando con el mismo nombre de usuario y contraseña.
 Si nos proporciona una dirección de correo electrónico, se le enviará un mensaje con las indicaciones para volver a la encuesta.
 Después de haber pulsado el botón Guardar, puede cerrar esta ventana del navegador o bien continuar respondiendo la encuesta.
 Para permanecer en el anonimato, utilice un pseudónimo/alias como nombre de usuario; tampoco es necesario que indique una cuenta de correo electrónico.

Nombre:

Contraseña:

Repetir contraseña:

Su dirección de correo electrónico:

[Volver a la encuesta](#)

You may click the survey web-link that you originally received through the C3-Cloud messaging system to “Load your unfinished survey”. Enter your self-selected user name to resume your survey from where you saved it:

- English version for SWFT pilot:

C3-Cloud: First survey for patients Load unfinished survey Exit and clear survey

Load a previously saved survey

You can load a survey that you have previously saved from this screen.
 Type in the 'name' you used to save the survey, and the password.

Saved name:

Password:

[survey](#)

- Swedish version for RJH pilot:

Ladda en tidigare sparad enkät

Du kan öppna en enkät som du tidigare sparat från denna sida.
Fyll i namn och lösenord du använde när du sparade enkäten.

Sparat namn:

Lösenord:

- Spanish version for BC pilot:

Cargar una encuesta previamente almacenada

Puede recuperar una encuesta guardada previamente desde esta pantalla.
Escriba el nombre que usó para guardar la encuesta y la contraseña.

Nombre guardado:

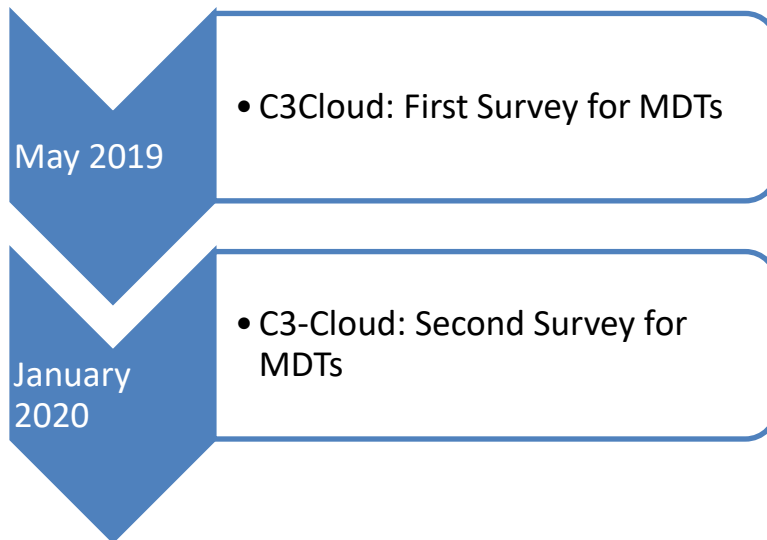
Contraseña:

An email with your user name, password and a link to load and resume your unfinished survey will only be sent to you if you entered an email address earlier. This is not required! If you choose not to give your email address, you will only need to remember your user name and your password yourself. Please note: For your own privacy we cannot retrieve either of them for you.

When will I need to complete the questionnaires?

The “First Survey for MDTs” will be send to you approximately in May 2019.

The “Second Survey for MDTs” will be send to you approximately in January 2020.



What do I do if I have problems accessing or completing the questionnaires?

The sections below give you guidance on what to do, or who to contact, if you encounter certain situations.

What if I forget my survey password?

Go to your log in page through the link you receive in the message, click on “Forgot your password”. If you have entered an email address, as it is explained in section 4.4, you will also receive the link in your inbox email. For a new password you need to enter your username and original email address that you entered when first clicking “resume later” on the LimeSurvey. LimeSurvey will set you a new password and send the password to you by email.

What if I cannot access the survey form online

If you are having problems with accessing the questionnaires, please contact:

- SWFT: either the C3-Cloud evaluation team (malte.vontottleben@empirica.com) or your local C3-Cloud project team contact (see Section “Who to contact for help” below).
- RJH: See Section “Who to contact for help” below.
- BC: See Section “Who to contact for help” below.

What if I need help to complete the form?

Generally, you should be able to answer the questions by yourself. You can also contact the members of the local team. Contact details are shown in Section “Who to contact for help” below.

What if I have more questions?

In case you encounter any unexpected errors in the questionnaire system or if you have any more questions regarding LimeSurvey, please contact:

- SWFT: either the C3-Cloud Evaluation Team (malte.vontottleben@empirica.com), or your local C3-Cloud project contact (Section “Who to contact” below).
- RJH: See section “Who to contact for help” below.

- BC: See section “Who to contact” below.

7. WHO TO CONTACT FOR HELP

If you encounter any problems with the C3-Cloud system please contact Local Helpdesk:

- SWFT: details TBC
- RJH: malin.carlsson@regionjh.se
- BC: CAU

If you need help with using the C3-Cloud system, or if you are concerned about anything in the project, please contact Local C3-Cloud Project Team:

- SWFT: details TBC
- RJH: malin.carlsson@regionjh.se
- BC: email: MARIAREMEDIOS.VEGAINIGO@osakidetza.eus; Phone number: 826823

If you have any problems accessing the questionnaires online, if you find any unexpected errors in the questionnaire system or if you have any more questions, please contact:

- SWFT: malte.vontottleben@empirica.com
- RJH: malin.carlsson@regionjh.se
- BC: email: MARIAREMEDIOS.VEGAINIGO@osakidetza.eus; Phone number: 826823

8. COMPLAINTS PROCEDURE

If you wish to raise a complaint about how we have handled your personal data, you can contact the Data Protection Officers at South Warwickshire NHS Trust or at Rother House Medical Centre who will investigate the matter. You can also contact the local study contact.

If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner’s Office (ICO).

9. FAQs

- *Is the C3-Cloud study a clinical trial?* This research is not a clinical trial but a technology study. The healthcare and medical treatments provided to the patient do not differ from that they would receive outside of the study. The patient thus has a right to know about any unexpected findings or discoveries unearthed as part of research carried out in C3-Cloud just as if the patient were not participating in the C3-Cloud study.

Does C3-Cloud replace the local system? No, the C3-Cloud system doesn’t replace the local system. Moreover, C3-Cloud has not yet been validated and should not be relied upon for clinical care. Please ensure only used alongside your normal processes and systems.

- *Do you have to use the local system along with the C3-Cloud system for the care of an intervention patient during C3-Cloud study?* Yes, as C3-Cloud does not replace the local system, some activities have to be managed through the local systems. This is the case for the

prescription and appointments. Health care professionals will write the medication as an activity in C3DP and then, they will execute the prescription in the local system, as usual. Likewise, each appointment included in the personalized care plan developed in C3DP will have to be managed in the local system accordingly.

- *Does the C3-Cloud system allow overwriting data from local health information systems?* The healthcare professional creates a care plan for the patient using information in C3-Cloud that has been brought in from the local patient information systems. To do so, some information will automatically have been put into the system from the local health information systems, e.g. demographics, diagnoses, medications, etc. However, the system does not allow data from local health information systems to be overwritten, (e.g. if the local system indicates a diabetes diagnosis, it cannot be deleted via C3DP).
- *What to do if any information is wrong in the local health information systems?* If when reviewing the clinical summary, the healthcare professional realizes there is an error, it has to be solved in the local system, as healthcare professionals cannot do corrections to the local system by C3-Cloud. The status of the record will be updated when the local system is revised. The next time the C3-Cloud system will retrieve the information then it will update it at the same time.
- *What to do if there is any data transformation error while retrieving data from local systems to the C3-Cloud?* If when reviewing the clinical summary, the healthcare professional realizes there is an error in the data transformation process, it has to be communicated to the local team (Section “Who to contact for help” above) to be investigated and corrected.
- *Can you (a healthcare professional member of a care team of a specific patient) add, modify, and/or remove information in C3DP?* In C3DP, while creating, updating, reviewing, etc. the care plan, you can add or update other information at any time in a specific section of C3DP that contains the patient data that is required by decision support systems. As all suggestions are dependent on these data you should check it for missing or incorrect data before any further action.

How to reconcile contradictory goals/activities/education materials from different MDTs? When coordinated care is managed collaboratively by a multidisciplinary care team, it may happen that different members of the team suggest self-contradictory recommendations for a patient. If this is the case, someone on the team has to take responsibility for addressing these issues and making the final decision. We propose that it should be the Care Plan Manager (usually the GP) as the team member who takes responsibility for solving this kind of conflict. The Care Plan Manager will be able consult and discuss with the healthcare professionals involved about the inconsistent suggestions in order to try to solve them, but it is not mandatory the consensus.

- *How to handle complaints & information governance/privacy breaches, and manage adverse events?* In case you, as a healthcare professional receive any complaints, are notified of data protection or privacy breaches, and/or you are aware of adverse events, please contact the local team (Section “Who to contact for help” above) as soon as possible. The local team will trigger the required actions according to the operational procedure of the site. The site has an established procedure for dealing with incidents and events related to data protection breach.

10. APPENDIX 1- PROCEDURE FOR WITHDRAWAL FROM THE STUDY

Participants (patient & carers and healthcare professionals) can withdraw their participation in the study at any time, implying that they will leave the study.

- *Procedure for the withdrawal of healthcare professionals:* If a healthcare professional wishes to withdraw from the C3-Cloud project (be that personal reasons, job moves, illness, retirement, etc.), then they should notify the local project contact (see section “Who to contact for help” above). It is at the healthcare professional’s discretion whether their personal data, including their opinions on usability and effectiveness of the C3-Cloud systems, are able to be retained by the C3-Cloud study following their withdrawal from the project. The decision is to be made at the point at when the professional notifies the study team of their decision to leave, although the healthcare professional will have indicated an initial preference on the consent form. NB: clinical data entered by the healthcare professional will be retained as this relates to the care of the patient and may be required for medico-legal purposes.
- *Procedure for the withdrawal of patients.* If a patient decides to withdraw from the study, they will need to inform the local study contact (see section “Who to contact for help” above), who will ask them if they would be willing to complete an optional withdrawal form. The patient’s decision to withdraw will be registered. It is at the patient’s discretion whether their personal data collected for the purposes of the C3-Cloud evaluation, including their opinions on usability and effectiveness of the C3-Cloud systems, are able to be retained by the C3-Cloud study following their withdrawal from the project. The decision is to be made at the point with when the patient notifies the study team of their decision to leave. If the patient makes the decision to allow their data to be retained then an optional withdrawal form can be signed.

Appendix 8 - User manual for the C3-Cloud System for Patients and Carers (PEP)

1. PURPOSE OF THE C3-CLOUD SYSTEM

The purpose of the C3-Cloud System is to provide you with access to your own personalised care plan and allow you to be more actively involved in the management and planning of your care. It aims to improve the interaction between you and your healthcare professionals. The system will allow information to be collected to support you and your healthcare professional with carrying out and monitoring your care plan.

With the C3-Cloud system, you can view and use the care plan, collect data using the tools in the system and share this data with the multidisciplinary care teams. You can also use the messaging function to further interact with your healthcare professionals. You can also access the educational and information materials assigned to your care plan to get information on how to self-manage your conditions.

If you need help and support with using the system you can give permission for other people such as your partner, children, carers, etc. to access your care plan with/for you in the C3-Cloud system.

2. ACCESSING THE C3-CLOUD SYSTEM

The C3-Cloud system is an online system which you can access using the internet with a modern, standard web browser (e.g. Chrome, Firefox, Safari, Edge, Internet Explorer 11). You don't need to download any software to use the system.

The C3-Cloud system is available to you at:

SWFT: www.c3pepweb.swft.nhs.uk

RJH: <https://c3cloud-pep.regionjh.se>

BC: <https://micarpetasalud.osakidetza.net/b65CarpetaSaludWar/login/inicio>

Log in

You must login before you can access your care plan and use the system.

(Pilot sites describe here their local procedure).

After successful login, you will be redirected to your C3-Cloud system home page (see Figure 1 below).

3. OVERVIEW

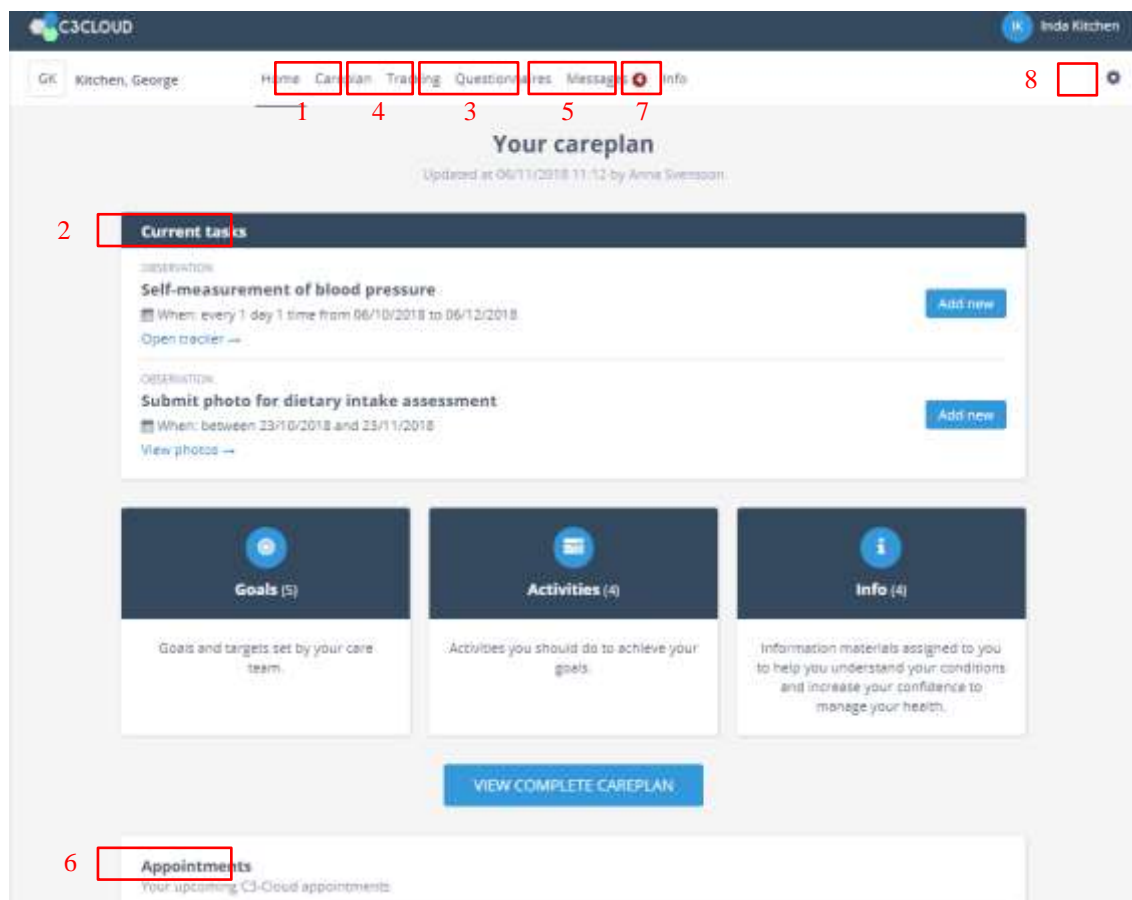


Figure 1. Home page overview.

In the example of Figure 1, Inda Kitchen, the informal carer of her husband George Kitchen, has logged in to access George's care plan.

The C3-Cloud System has the following main sections for you:

Careplan (Number 1 in Figure 1). This is where you can access your personal care plan. From here you can view and act on any goals, activities or information materials that have been assigned to you by your healthcare professional. From your care plan you can access additional functions like data collection tasks.

Task list (Number 2 in Figure 1). The system displays on the home page any active tasks that your healthcare professional has asked you to perform in the system. Please note that the task list is only shown if there are any active tasks available.

Questionnaires (Number 3 in Figure 1). During the study, your healthcare professional may ask you to complete one or more health related questionnaires. From here you may start filling in the assigned questionnaires (please note that this feature depends on the service configuration and may not be available to you) and you can also access your previous questionnaire answers.

Tracking (Number 4 in Figure 1). In this section, you can add measurements and other observation data, e.g. blood pressure, and also view data that you submitted previously.

Messages (Number 5 in Figure 1). Use this section to read the messages from, and send messages to, your care team.

Appointments (Number 6 in Figure 1). Here you can see the appointments your care team has created for you. Please note that you cannot book new appointments via the C3-Cloud system.

Info (Number 7 in Figure 1). This section contains information educational material that has been assigned to you by your healthcare professionals, e.g. leaflets about your conditions or treatments.

Settings (Number 8 in Figure 1). Here you can check your account information that is stored in the system.

4. CARE PLAN

Once your care plan has been created, your healthcare professional will notify you that it is available for you to view and update in the system. You will also receive a notification if/when any changes are made to your care plan.

On your home page, you get a high-level summary of your care plan and you can easily open and view the full care plan, as shown below.

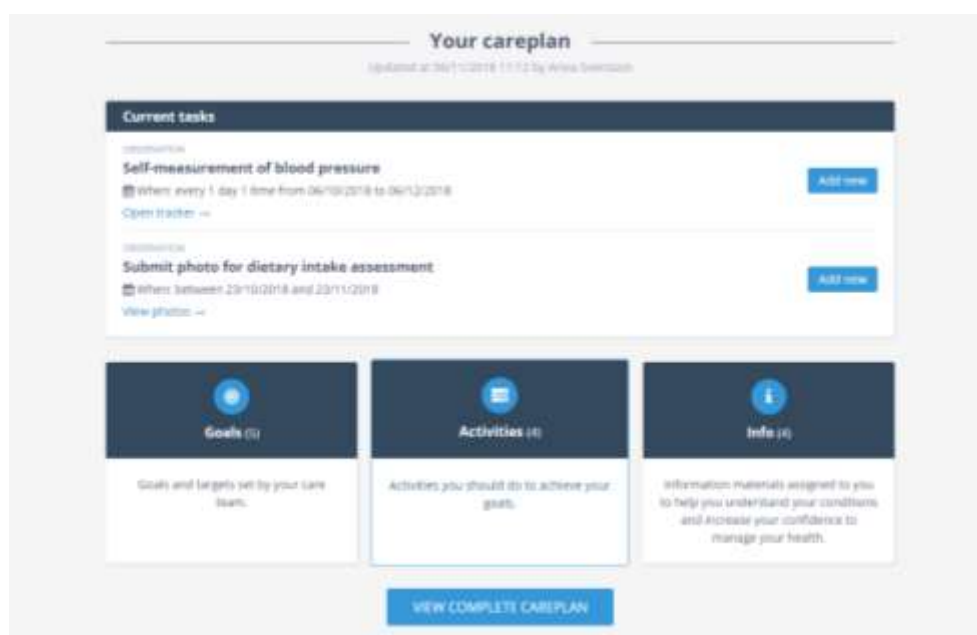


Figure 2. Care plan info on the home page

To view the full care plan, click on the ‘View complete care plan’ button. Alternatively, click on one of the Goals, Activities or Info boxes or click on the ‘Careplan’ link in the top menu.

The system displays now the full care plan to you. This includes the care plan header, goals, activities and the information materials assigned to you.

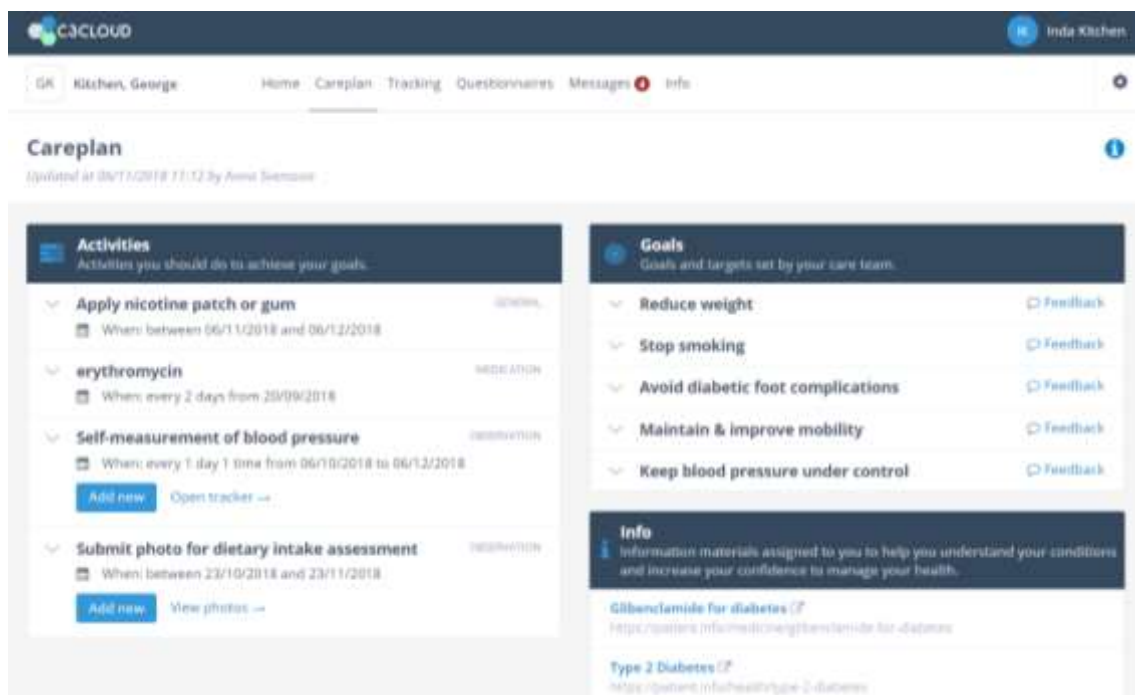


Figure 3. Example Careplan view


Goals

You can view the list of goals assigned to you in the care plan and their details. By default, only the title of each goal is displayed, as in the example of ‘Keep blood pressure under control’ below.



Figure 4. Goal with only title visible

You can view the other available goal details by clicking on the goal title.



^ **Keep blood pressure under control** [Feedback](#)

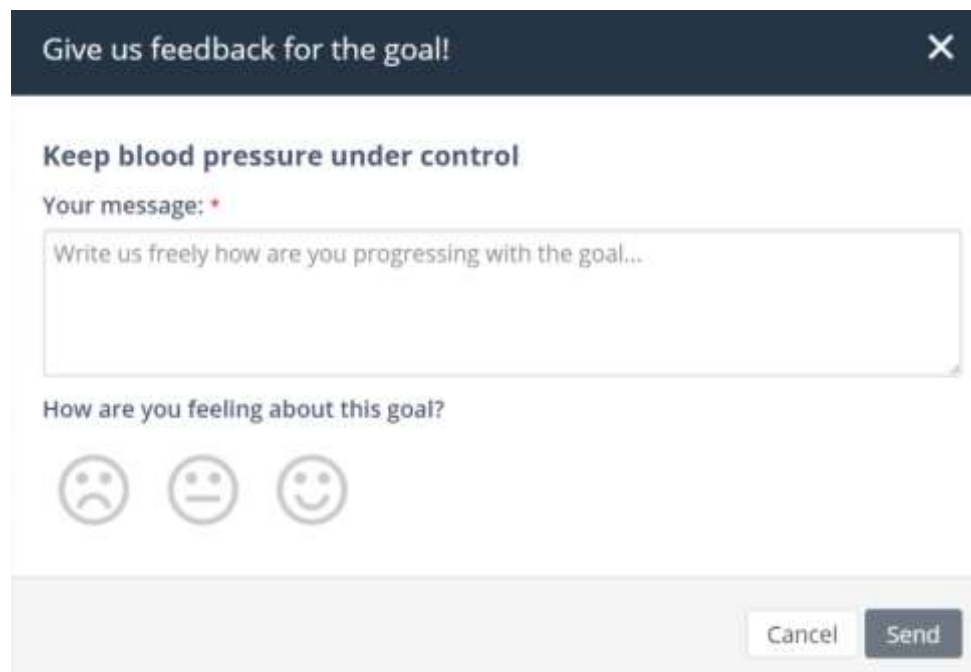
- ↑ Priority: High Priority
- Status: In Progress
- 📅 Start: 07/08/2018
- 📅 Due date: 08/11/2018
- Target:
Systolic Blood Pressure < 130 mmHg
Diastolic Blood Pressure < 80 mmHg
- 👤 Expressed by: Anna Svensson

Figure 5. Goal with additional details visible

Click again on the goals title to hide the details.

Goal feedback

You can send feedback to your care team about any of your listed goals. Click on the '**Feedback**' link next the goal title (as shown in Figure 5 above) and the system opens a view for you enter your feedback.



Give us feedback for the goal! ✕

Keep blood pressure under control

Your message: *

Write us freely how are you progressing with the goal...

How are you feeling about this goal?

☹️ 😐 😊

Cancel Send

Figure 6. Screen where goal feedback can be entered

Enter your feedback message and choose how you're feeling about the goal by clicking on one of the 'face' icons. Press **'Send'** to complete your feedback and the system makes the feedback available to your care team.

Activities

Here you are able to view any activities that your care team has added to your care plan. This may include general activities for you to perform as part of your daily or weekly routine (e.g., diet, exercise), medication activities (medications prescribed to you) and requests to provide data (e.g. fill in patient questionnaires, enter measurement values, upload meal photos, etc.). The system always displays the activity title, but for some activities a timing will also be provided, i.e. when you should be doing the activity or when by.

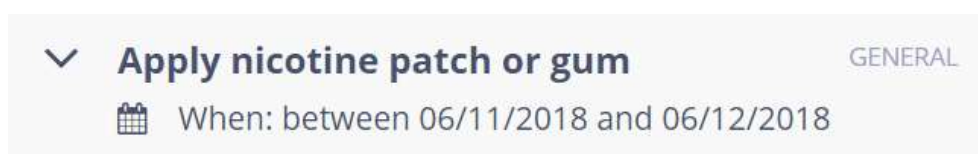


Figure 7. Activity with details hidden

You can show the other available activity details by clicking the activity title. The detail screen is then displayed as in Figure 8 below.



Figure 8. Activity with details visible

Click again on the activity title to hide the details.

Some activities include additional tasks in the system you are asked to be perform. The tasks vary according to the type of activity.

For patient questionnaire activities, the main task is to answer the questionnaire within the timescales that have been set. The system provides you with a link to start answering the questionnaire. If you interrupt answering, the partial answer is kept and the system provides you with a link to continue answering (alternatively you may also remove the partial answer if you don't intend to complete it).

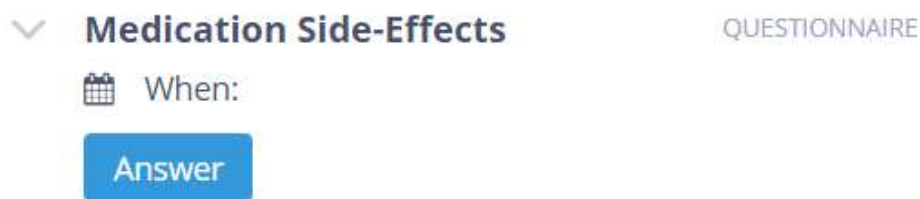


Figure 9. Example of start answering questionnaire from activity

If your care team ask you to record measurement or other observational data, e.g. blood pressure, you can add new data but also view any data you have entered previously. Please note that the ‘Add’ and ‘View’ link texts may vary for different data types.

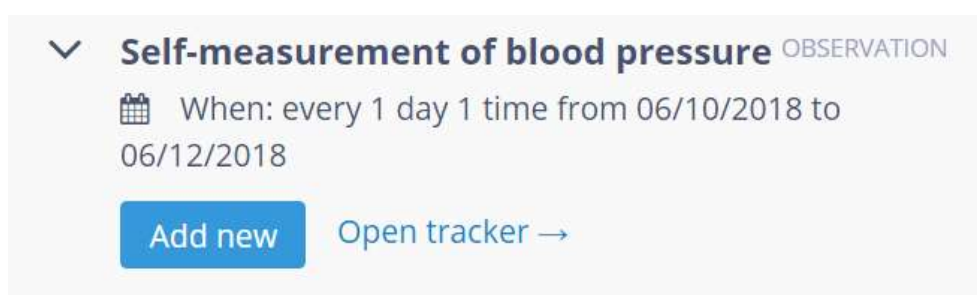


Figure 10. Actions for a measurement activity

Assigned information materials

Your care team may also assign information to you in the system, e.g. information leaflets about your condition or treatment, when updating your care plan. You can find and access these materials via your ‘Careplan’ view. Please take some time to open each of them and access the materials at least once. You open the information and educational materials by clicking on the provided link. Please note that most materials are opened to a new tab in your browser.

Info
i Information materials assigned to you to help you understand your conditions and increase your confidence to manage your health.

Glibenclamide for diabetes [↗](https://patient.info/medicine/glibenclamide-for-diabetes)
<https://patient.info/medicine/glibenclamide-for-diabetes>

Type 2 Diabetes [↗](https://patient.info/health/type-2-diabetes)
<https://patient.info/health/type-2-diabetes>

Back pain exercise [↗](https://patient.info/health/back-and-spine-pain/features/video-back-pain-exercises)
<https://patient.info/health/back-and-spine-pain/features/video-back-pain-exercises>

Diabetes, Foot Care and Foot Ulcers [↗](https://patient.info/health/diabetes-foot-care-and-foot-ulcers)
<https://patient.info/health/diabetes-foot-care-and-foot-ulcers>

Figure 11. Care plan information materials example

5. TASK LIST

When you have active tasks to perform in the C3-Cloud system, the system displays these on your home page. The system displays the title (what to do) and the timing info (when you should perform the task) and provides you a link to start doing the task.

Please note that the task list is only shown if there are active tasks to be displayed (i.e. the list is completely hidden if no active tasks have been assigned to you).

Current tasks

Observation
Self-measurement of blood pressure
When: every 1 day 1 time from 06/10/2018 to 06/12/2018
[Open tracker →](#)

Add new

Observation
Submit photo for dietary intake assessment
When: between 23/10/2018 and 23/11/2018
[View photos →](#)

Add new

Figure 12. Example of the active tasks list to be performed by you

6. DATA COLLECTION

One of the objectives of the C3-Cloud system is to provide computerized means to collect information to enable the monitoring of the status and progress of your care plan and its goals and activities. The two main ways to collect this data are patient questionnaires, and entry of measurement values (e.g. blood pressure) and other observation data (e.g. meal photos).

Patient questionnaires

Your care team may ask you to complete some of the patient questionnaires that are available in the system. To access a questionnaire when requested, please check the task list on your home page. When the questionnaire task is active, the task list provides you quick and direct access to the questionnaire. Alternatively, you can click on the 'Careplan' menu link and access it from your Careplan view. Click on the 'Answer' button and the system opens the first page of the questionnaire to you.

Medication Side-Effects
 QUESTIONNAIRE

When:

 Answer

Medication Side-Effects

Do you experience side effects on your medications? *

☒ Yes ☐ No

Which side effects have you experienced? *

How severe are the side-effects you have experienced? *

☐ Mild ☐ Medium ☐ Severe

NEXT →

Stop and save

Medication Side-Effects

This is a summary of your answers. Please review your answers and edit them if needed. When you are ready, please **press "Complete" to submit your answers.**

Edit

Do you experience side effects on your medications?	Yes
Which side effects have you experienced?	Headache
How severe are the side-effects you have experienced?	Severe

COMPLETE

Figure 12. Example questionnaire flow

Please follow any instructions provided on the questionnaire pages. Please answer all the required questions (required questions are marked with a star). We would appreciate it if you could take the time to answer any optional questions also. When you have completed the questions on the current page, please click on 'Next'. If any of the answers are invalid, the system tells you what errors there are. If your input is valid, the system opens the next page until you reach the end of the questionnaire.

Medication Side-Effects

Do you experience side effects on your medications? *

☒ Yes ☐ No

Which side effects have you experienced? *

How severe are the side-effects you have experienced? *

☐ Mild ☐ Medium ☐ Severe

NEXT →

Stop and save

Figure 13. Example questionnaire page

For most questionnaires the system displays at the end a review page (a page with a summary of all your answers). When displayed, please take a moment to check your answers before you mark the questionnaire completed. You can return to your answers and change them if needed. **When you have checked your answers, please press the ‘Complete’ button.** Your answers are not shared with your care team before you have marked the questionnaire answer as completed.

Medication Side-Effects

This is a summary of your answers. Please review your answers and edit them if needed. When you are ready, please press "Complete" to submit your answers.

Edit

Do you experience side effects on your medications?	Yes
Which side effects have you experienced?	Headache
How severe are the side-effects you have experienced?	Severe

COMPLETE

Figure 14. Example questionnaire completion page

Measurements and other observations

You may be requested by your care team to enter measurement and other observation data, e.g. blood pressure. To be able to enter data, please check the task list on your home page. When a data entry task

is active, the task list provides you quick and direct access to the data entry screen. Alternatively, you can click on the 'Careplan' menu link and access it from your Careplan view. Click on the 'Add' new button and the system opens a dialog page to enter the data.

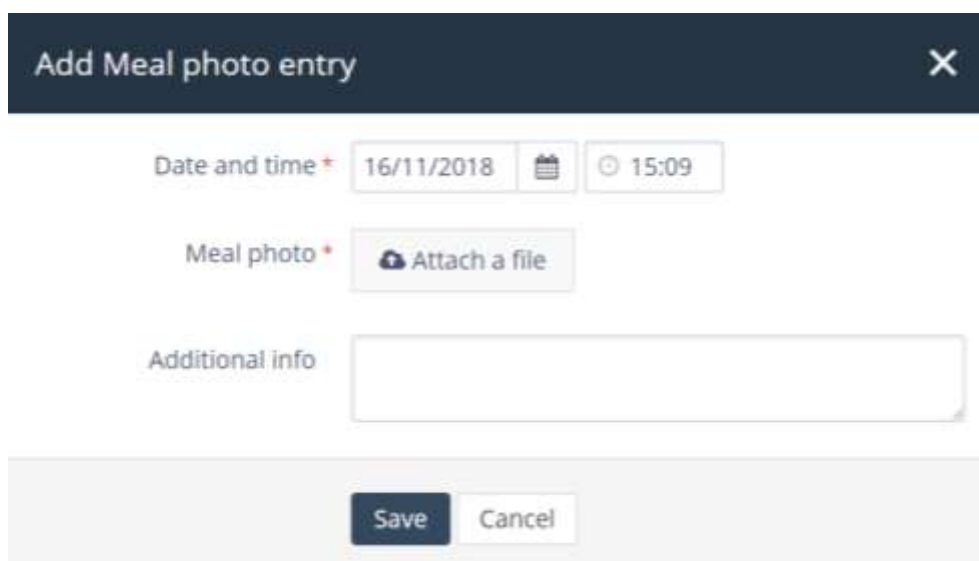


Figure 15. Access data entry from activity



On the data entry screen, fill your values in the fields (required fields are marked with a star) and press 'Save' to store the data. If you have entered any invalid data, the system tells you what errors there are. Please note that the data requested is different for each observation type.


Figure 16. Example data entry (blood pressure)

Some observation types include adding photos, files or other attachments (e.g. meal photos). For these, the system asks you to choose and upload the file(s) from your local computer (or a cloud file storage you are connected to). If the device you are using to access the system is equipped with a camera (e.g. mobile phones), you take and upload photos directly without storing them locally on your device.



Add Meal photo entry X

Date and time ⁺ 16/11/2018  15:09 

Meal photo ⁺  Attach a file

Additional info


Save Cancel

Figure 16. Example of data entry with file upload (meal photo)

You can access previously entered values by opening the relevant tracker from the link in the activity. Alternatively, you can access these values via the Tracking section. Click first on the 'Tracking' menu link and next choose the relevant tracker to open the tracker view. You can mark trackers that you use frequently as a favorite for easier access. To mark a tracker as a favorite, click on the star icon in the top right corner in the tracker view. Click again on the (filled) star to remove the tracker from your favorites'.



Activate tracking X

Blood glucose	
Blood pressure	
Height	
Meal photo	
Weight	

Close

Figure 18. Example of active tracking



Figure 19. Example of data entry form (blood pressure)

7. CONTACTING THE CARE TEAM

The C3-Cloud system provides you with a computerized means to interact with your care team. Sharing the care plan and collecting structured data are essential for this objective but in addition to these you can communicate and discuss your care and health with your care team with the Messaging functionality.

Note! It is very important that you do not rely on the messaging function, especially for urgent care issues. If you need emergency assistance, please contact with your local contact (in each site).

Messaging

Click the Messages menu link to open the 'Messaging' section. Here you can view your messages, reply to messages, send new messages and manage your messaging settings.



Figure 20. Messaging menu link

Note! On computerised devices with smaller screens, the Messages menu link is replaced by an envelope icon.

Note! When you have new, unread messages, the system displays clearly the number of unread messages in the menu link (or the envelope icon) as in Figure 21 below.

Viewing messages

The main Messaging view has three message lists for you:

- Inbox with received messages,
- Your Sent messages
- Drafts view with any draft messages you have saved

Your Inbox displays the number of unread messages in it and your Drafts list display the number of drafts you have saved. To change the displayed list, click on the name of the list.

You can filter the displayed messages by entering text into the Search textbox. The system will display only those messages that contain the text entered into the Search box.

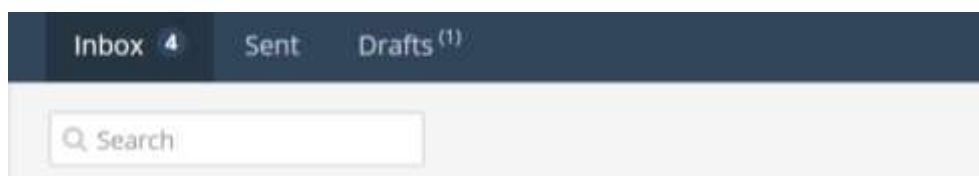


Figure 21. Messaging lists and message search

To view a message, please click on the message you want to read. The system shows the message with its details (who, when, message subject and content and any attachments). If the message includes attachments, you can open them by clicking on the provided attachment link.

Replying to messages

When viewing a message, you can reply to it by clicking on the **'Reply'** link at the top of the message view. The system shows you now a form on which you can check the Subject and write your message. You can also add attachments to your reply if needed. Press **'Send'** when you have completed your message. Alternatively, you can save your message as a draft and complete it later. You find your saved drafts in the Drafts in the main Messaging view.

Sending messages to the team

To start a new conversation with your team, open Messaging and click on the 'New message' button in the main View. The system opens a form to write the message.

Note! This feature is available only if your organization has granted you the right to send new messages to your care team. If you don't have this feature available and think it should be, please, contact your organization and ask them support.

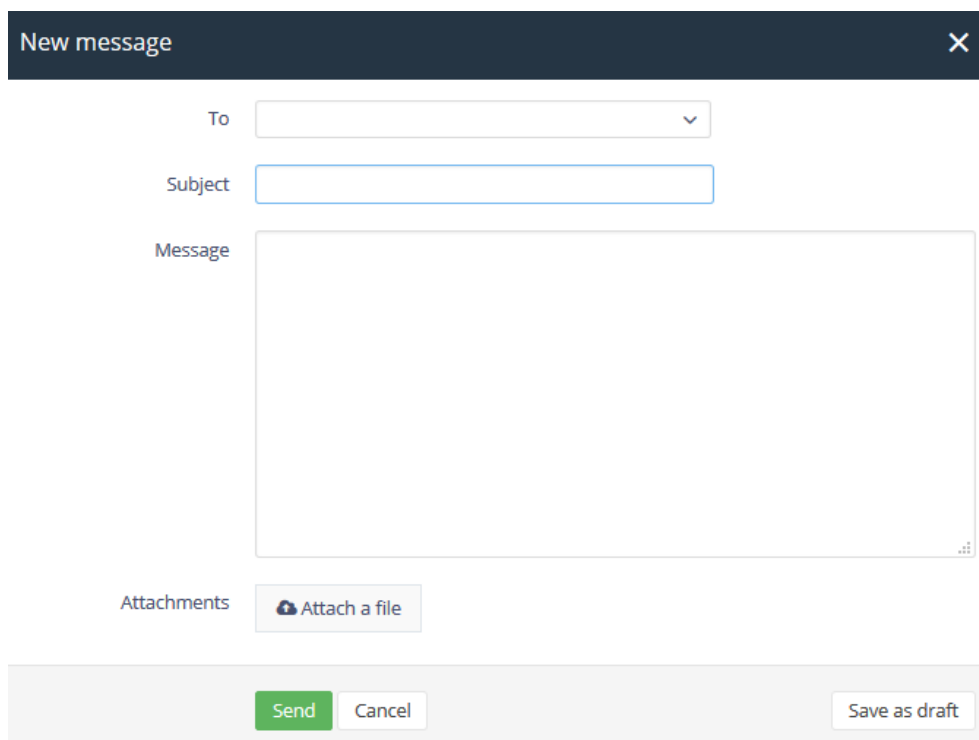


Figure 22. Send new message

Choose the message recipient in the select list, enter a subject for your message and write the message in the Message field. You can add attachments (e.g. photos, files) to your message. Press 'Send' when you have completed the message. Alternatively, you can save the message as a draft and continue later editing and completing the message. You find your saved drafts in Drafts view in the main Messaging view.

Messaging settings - Notifications

You can toggle whether the system sends you email notifications when you receive new messages in C3-Cloud. To manage it, access your messaging settings, click on the **...** link to the right and choose Notifications.

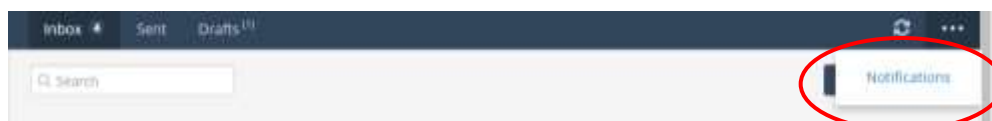


Figure 23. Notifications

Messaging email notifications enabled.

You receive an email notification when your care team sends a new message (**Note! this requires that your email address has been registered in C3-Cloud**).

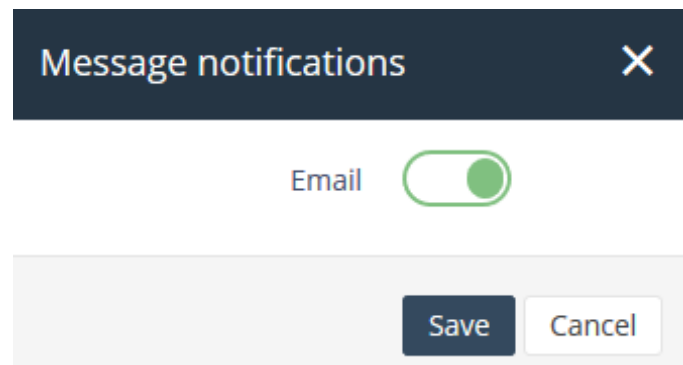


Figure 24. Notifications enabled

Messaging email notifications disabled.

You have chosen that email notifications are not sent to you when you receive a new message from your care team.

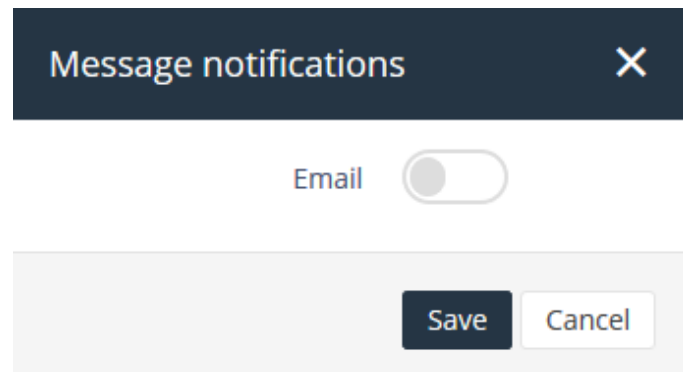


Figure 25. Notifications disabled

8. APPOINTMENTS

You can view on your home page appointments your care team has added to your care plan. These appointments are for activities performed at the health provider's locations.

For each appointment, the system displays the descriptive title, the booked date and start time and location where you should go to for the appointment. Please note that the appointment list is only shown if there are active appointments to be displayed (i.e. the list is completely hidden if no appointments).



Figure 26. Example appointment list

You can show the other available details by clicking on the appointment title. Click again on the title to hide the details.

9. INFORMATION AND EDUCATION MATERIALS

The Info section provides you access to shared informational and educational materials common to all our patients. To access the Info section, please click on the ‘Info’ menu link in top menu. The system opens and displays a page with all the common information materials.

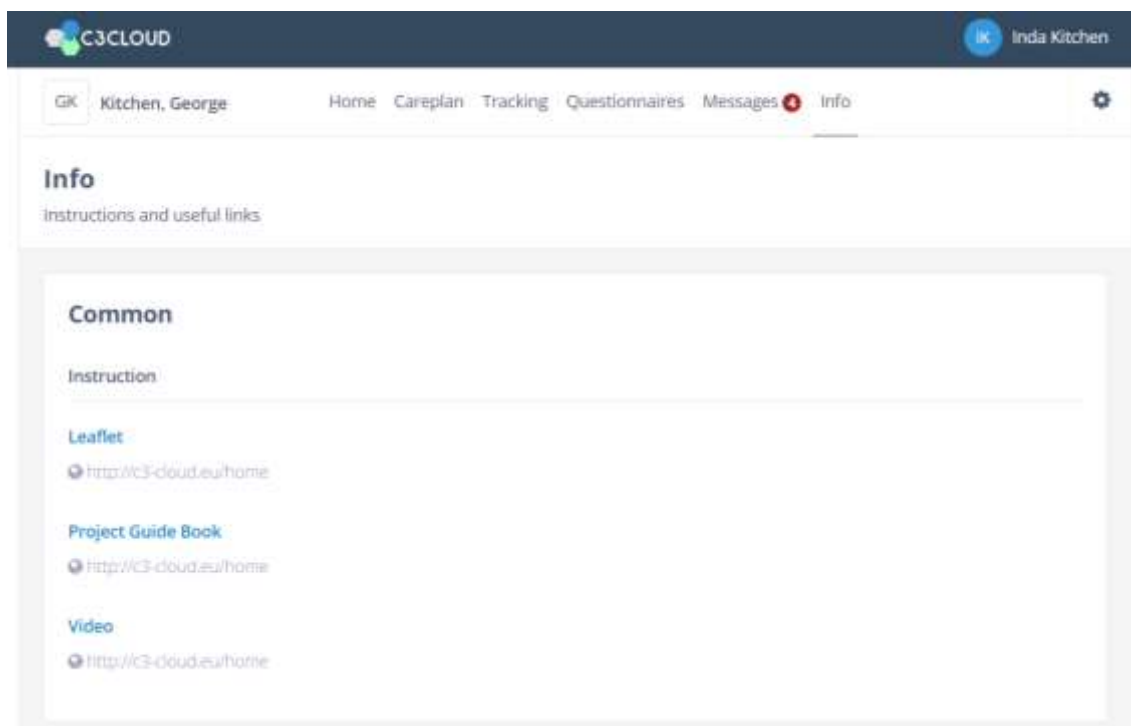



Figure 27. Info view with example content

Click on any of the listed item to access that information material. Please note that most materials are opened in a new browser tab (this view remains available in the original tab).

10. ACCOUNT SETTINGS

You can view your account and profile information in the Settings section. Click on the gear icon  in the top menu to access the Settings section.

If you notice any incorrect information in your account and/or profile settings, please contact [local procedure here] so that they correct this.

Change password

[SWFT only – other pilots have external authentication with account management in this solution]

To change your current password, please open the Account settings tab. Next click on the ‘Change password’ button. The system opens a dialogue box, where you enter your password and the new password twice (to avoid typos in the new password). Press Change password button and the system stores your new password.

Change password X

Current password *

New password *

Password length must be between 8-20 characters and the password must include at least one digit.

Retype password *

Retype new password

Change password Cancel

Figure 28. Form to change your current password

Forgotten password

[SWFT only – other pilots have external authentication with account management in that external solution]

If you don't remember your password, you can reset it yourself. Please click on 'Forgot your password' link on the front page of the system (you can find it below the log in fields and the sign in button). The system asks you to enter your user id.

[Or contact the C3-Cloud project organization who gave you the credentials when you enrolled as a C3-Cloud patient]

[BACK TO FRONTPAGE](#)

Request new password

Enter your user id used in registration below. We will send you a link to order a new password.

User Id

Send Cancel

Figure 29. Request a new password

When you have entered your user id and press 'Send', the system will send an email to the email address stored in your account details. Open the email and click on the link in it. This will open a page in your browser, on which you set a new password for you.

Reset password

Fill out below your user id and your new password to finish changing your password.

User Id *

New password *

Password length must be between 8-20 characters and the password must include at least one digit.

Retype password *

Save

Cancel

Figure 30. Reset the forgotten password

Enter your user id and type the new password twice (to avoid typos in the new password). Press ‘Save’ and the system sets your new password. You can now log in using your user id and the new password.

11. FEEDBACK AND TECHNICAL SUPPORT

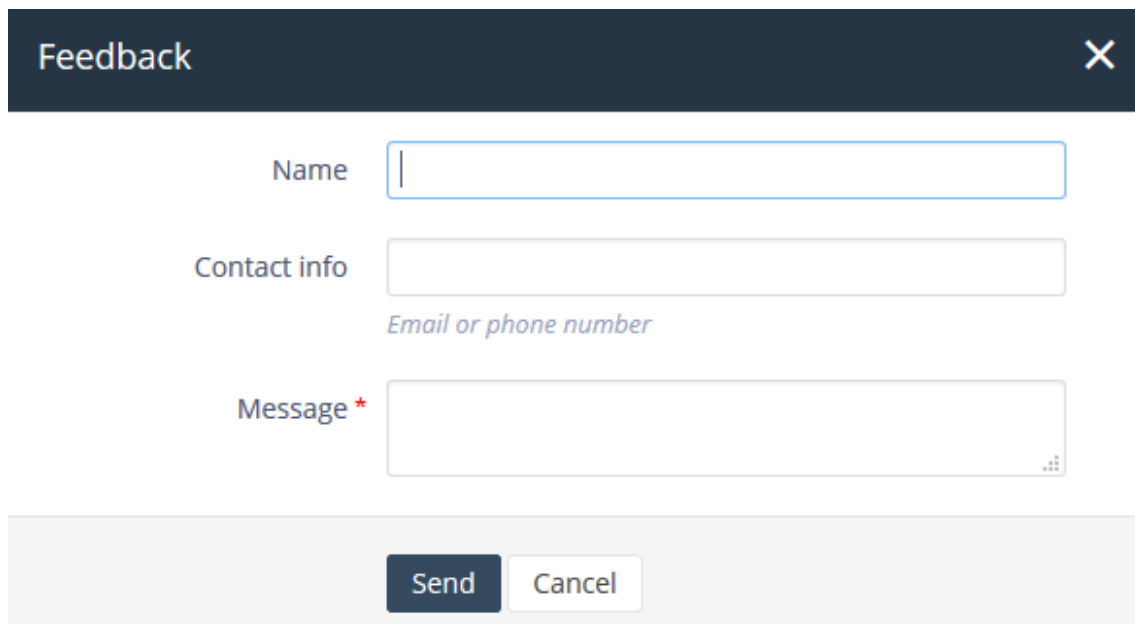
If you encounter an unexpected error in the system, or you have general questions about the system or just want let us know any ideas or other feedback about the C3-Cloud system, you can use the general feedback functionality to contact us.

You can also contact your local C3-Cloud project team through the following: TO BE UPDATED ACCORDING TO EACH PILOT SITE

Note! Please note that this feedback is only intended for general and technical feedback and not for questions about your health and conditions. For health-related questions, please consult your care team as instructed by them.

You can access the feedback form by clicking on the ‘**Feedback**’-link in the page footer at the bottom page of the screen.

Please enter the requested details in the form and press the ‘Send’ button.



The image shows a feedback form with a dark blue header bar containing the word "Feedback" and a close button (X). Below the header, there are three input fields: "Name" (a single-line text box), "Contact info" (a single-line text box with the placeholder text "Email or phone number" below it), and "Message" (a multi-line text box with a red asterisk indicating it is required). At the bottom of the form, there are two buttons: "Send" (dark blue) and "Cancel" (light gray).

Figure 31. Example of feedback form

Appendix 9 - User Manual for the C3-Cloud System for Health Professionals (C3DP)

1. INTRODUCTION

Background

The C3-Cloud system has two main parts - the **Patient Empowerment Platform (PEP)** for the patient and the **Coordinated Care and Cure Delivery Platform (C3DP)** for members of the **multidisciplinary care teams (MDT)** (Figure 17). C3DP is used by healthcare professional to create a care plan for the patient using information from the local healthcare IT systems. Once the care plan has been approved by a General Practitioner or other appropriate care healthcare professional, the care plan is available to the patient on the PEP. The patient can view and use the care plan created together with the members of the care team.

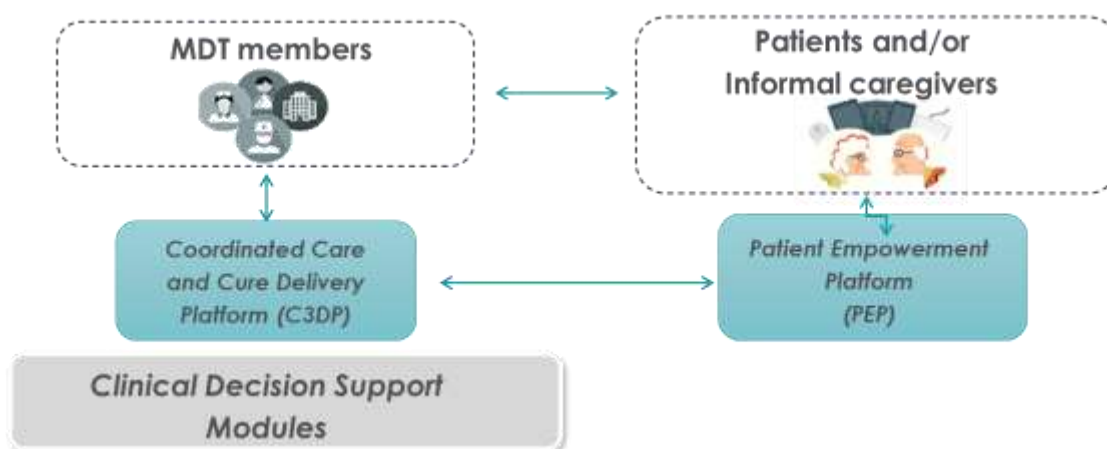


Figure 17. Overall C3-Cloud architecture

Objective of the Coordinated Care and Cure Delivery Platform (C3DP)

The aim of the Coordinated Care and Cure Delivery Platform (C3DP) is the creation and execution of personalized care plans for patients with multimorbidity, with assistance from Decision Support Modules for recommendation reconciliation, poly-pharmacy management and goal setting. It should be noted that poly-pharmacy management is limited in South Warwickshire (SWFT & Rother House) care settings due to missing coded medication data in the local healthcare systems.

C3DP enables long-term, continuous, coordination of patient-centred care activities by a multidisciplinary care team (MDT) composed of health professionals, social care workers and homecare providers, and by the patients and their informal care givers, including family members. Active patient involvement and treatment adherence is achieved through a connected Patient Empowerment Platform ensuring patient needs are respected in decision making and taking their preferences and psychosocial aspects into account.

2. MAIN FUNCTIONALITIES OF C3DP

C3DP is the main mechanism used by care team members, to define, update, reconcile and share care plans. C3DP also provides clinical decision support modules, organizes online care plan review meetings, receives patient data from local care systems and the Patient Empowerment Platform, and provides a dashboard for care team members to see a basic medical history of the patient along with the care plan lifecycle history.

Patients and informal care givers (where applicable) are also able to participate in the care planning process using the Patient Empowerment Platform (PEP) which is linked to C3DP. Two-way data exchange between C3DP and PEP has been implemented for sharing of the care plan from the C3DP side to the PEP side of the system; and retrieving patient observations (e.g., meal photos, medical device measurements), questionnaire responses and feedback regarding the assigned activities from the PEP to C3DP. Patients and healthcare professionals are also able to communicate with each other using a messaging system which is built into C3DP & PEP. This works in the same way as email.

The major functionalities provided by C3DP for personalised and coordinated care planning are listed below:

- Review of patient medical summary
- Cross-check of all patient data that are needed as input by the Clinical Decision Support (CDS) services
- Management of the care plan building blocks; goals, activities and education materials
 - Manual entry from scratch
 - Recommendations from the CDS services
- “Execution” of a care plan
 - Updating the progress of goals and activities
 - Re-execution of CDS services during planned and unplanned encounters
 - Automatic linking of patient provided data to the care plan activities
 - Commenting on the care plan items
 - Semi-automatic update of the care plan template and associated CDS services as the major diseases of the patient accumulates (e.g. the patient starts with type 2 diabetes and chronic kidney disease, and in time develops depression as well)
 - Exporting a care plan as a PDF document which can be stored or attached to a patient’s core health care record
 - Closing a care plan
- Management of the care team
 - Inviting new care team members
 - Removing existing care team members
- Communication among care team members and with the patient / informal care giver
 - Messaging
 - Organization of tele/video conferences
- Dashboard view
- Patient provided data view

- Questionnaire responses from the patient
 - Vital sign measurements provided by the patient
 - Photographs sent electronically by the patient
 - Messages sent by the patient
- Schedule
- Real-time system notifications, e.g. updates to care plan by the patient and messages
- Administration functionalities for the pilot site coordinators:
 - Batch message sending to care team members or patients
 - Management of all care team members and patients
 - Management of education materials
 - Management of value sets (i.e. terminology systems)
 - Management of organizations and locations
 - Export of anonymised data for evaluation studies

All these functions are presented step by step on the C3DP user interfaces in the next sections.

3. USE OF THE C3DP

This walkthrough involves a complete series of all the possible functionalities that a care team member (a health professional or a social care worker) is able to perform. It presents a complete step-by-step demonstration of the C3DP Web based system for management of a personalized care plan.

Accessing the C3-Cloud System

The C3-Cloud system is an online system which you can access using the internet with a modern, standard web browser (Chrome, Firefox, Edge, Safari). You don't need to download any software to use the system. Note: **THE SYSTEM DOES NOT WORK WITH INTERNET EXPLORER.**

The C3-Cloud system is available to you at the local address for each site. Please save this link to your favorites in your internet browser on any computers that you access so that it easy to access each time.

Login [Needs to be specialised according to local pilot site procedure]

You must login before you start using the system. When you open the system address in a Web browser, you will be forwarded to the login page (Figure 18).

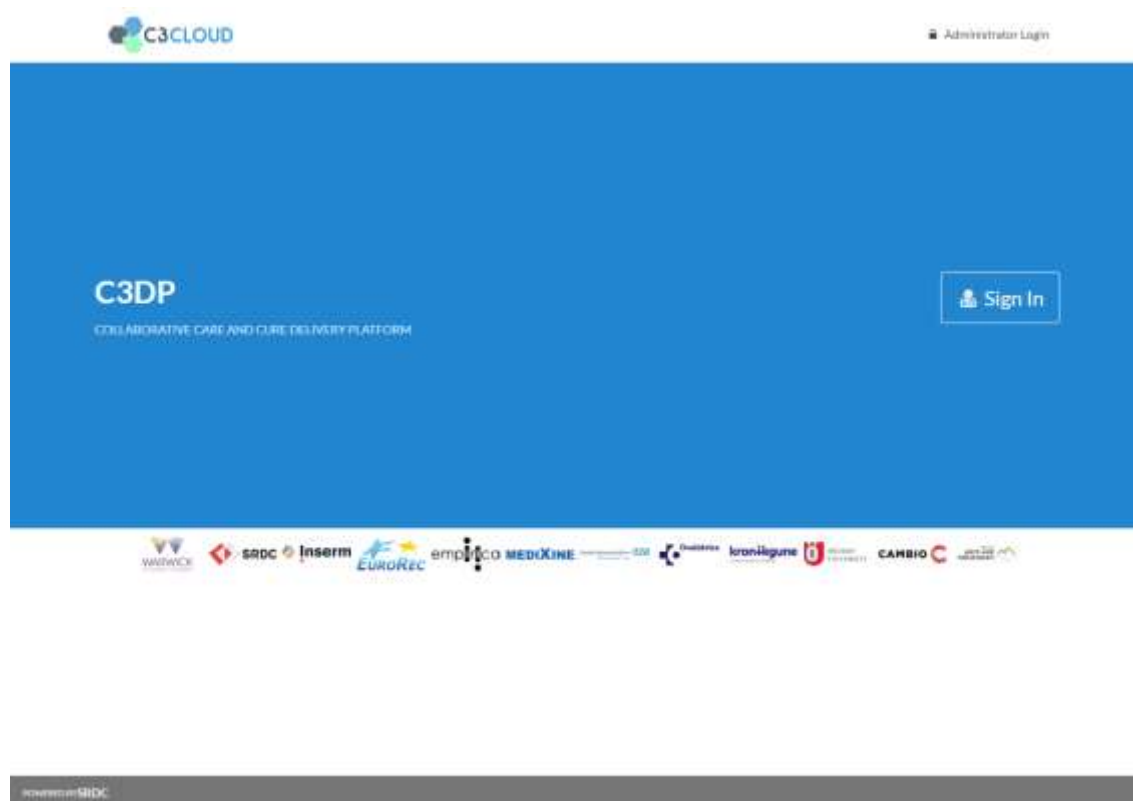


Figure 18. Login Page

To sign in as a health professional or social care worker click the “Sign In” button (pilot site coordinators shall use the “Administrator Login” button to login) and you will be redirected to the C3-Cloud’s login system (Figure 19).

Figure 19. C3DP login screen

At the screen in Figure 19 above, you need to choose a login provider. If you are a health professional and your region’s authentication provider is integrated with C3-Cloud, you need to select your region, e.g. “Region Jämtland Härjedalen” in this figure. In the next step, you will be directed to the selected authentication provider (Figure 20).

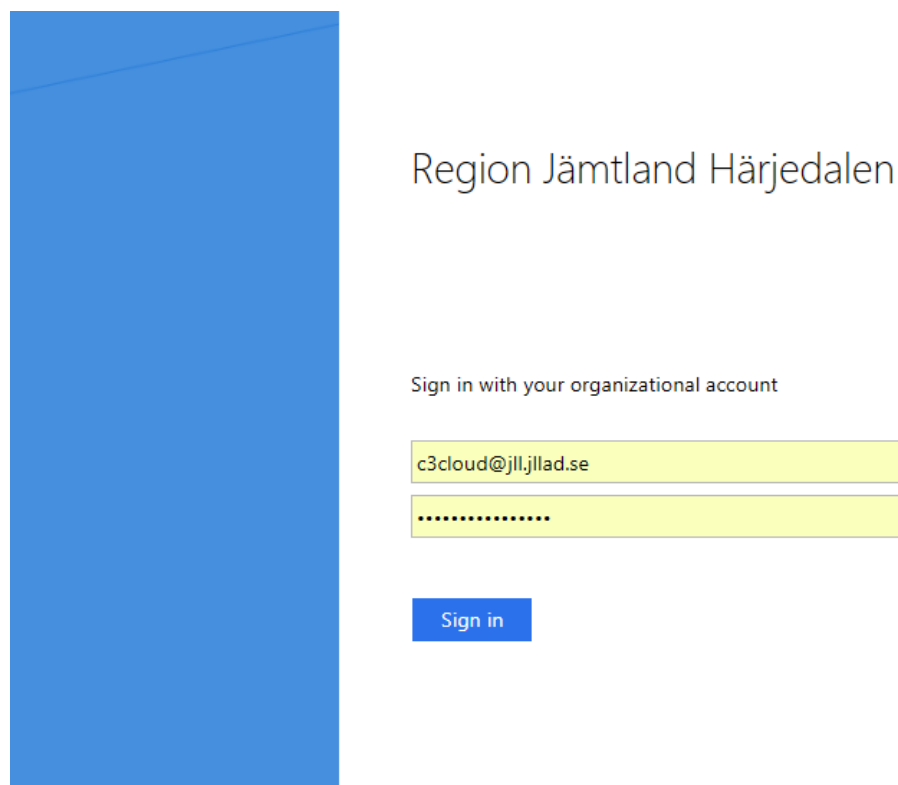


Figure 20. Existing authentication provider of a pilot site

If you are a social care worker, you need to select “Continue with C3-Cloud IDP” in Figure 19. Similarly, if you are a health professional but your local authentication provider is not integrated with C3-Cloud, then you need to select again “Continue with C3-Cloud IDP”. You will be asked for a username and password as shown in Figure 21 below.

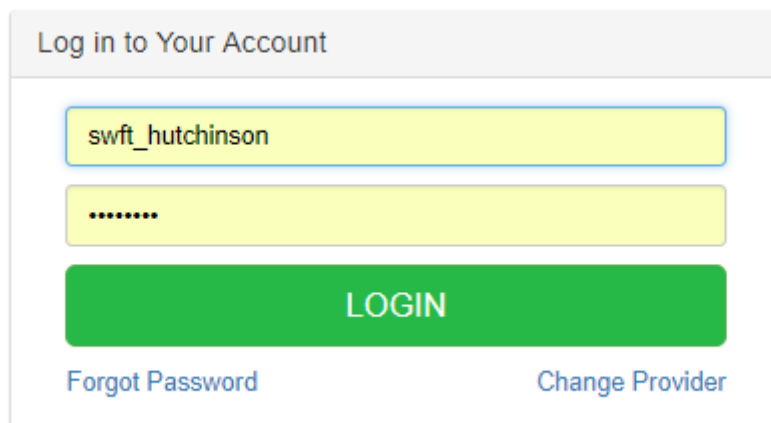
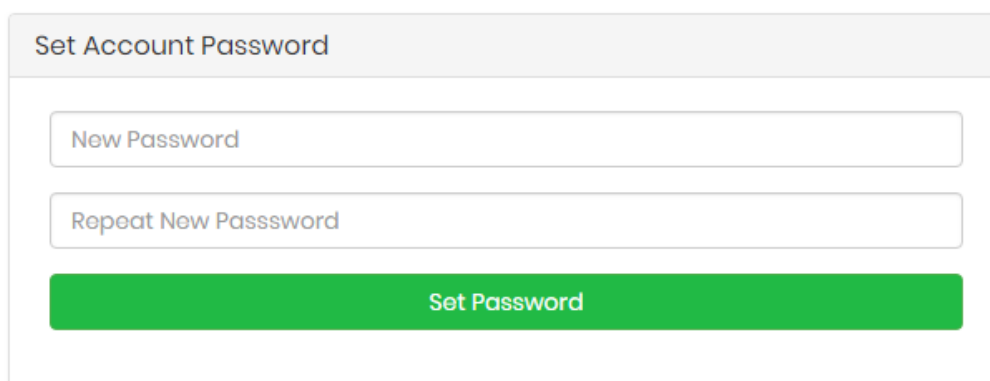


Figure 21. C3-Cloud local authentication provider

If the password is provided to you by a system administrator, you may be asked to change it in your first login. Type the new password and click “Set Password” to proceed (Figure 22).



The form is titled "Set Account Password" and is contained within a light gray border. It features two input fields: "New Password" and "Repeat New Password", both with light gray text placeholders. Below these fields is a prominent green button with the text "Set Password" in white.

Figure 22. Set New Password

If it is the first time you are using the C3-Cloud system, you will be asked for your consent to use your account in the C3-Cloud system (Figure 23 below). Please click on 'Accept' to continue. It is also advised to click on "Remember my decision" so that you will not be asked for your consent again.




The authorization screen has a blue header bar with the text "C3DP needs authorization to access following information:". The main content area is white and divided into two columns. The left column contains the C3CLOUD logo, a "Client Name:" field with the value "C3DP", a "Human readable client name:" field, a "Contacts:" field, and links for "Terms of Service URL" and "Policy URL". The right column has a blue header "Access To" followed by three checked items: "basic profile information", "log in using your identity", and "access rights for health data". Below this, a message states "Accepting authorization request will redirect you to http://localhost:8200/home". At the bottom of the right column are "Accept" and "Deny" buttons, and a checkbox for "Remember my decision".

Figure 23. The user authorizes C3DP to use her account

Home Screen

After a successful login, you will be redirected back to the C3-Cloud system and you will be welcomed via the home screen (Figure 24 below). This screen is like a dashboard that consists of navigation menus and information blocks to show the active patients of the user, incoming activities, new messages and notifications. It should be noted that only the most recent data is displayed here in the dashboard. For

further patients / activities / messages / notifications, relevant sections should be followed, as explained in the next sections.

You will be reminded that you are using C3-Cloud as part of a research study and you shouldn't rely on it for the purpose of clinical care. This reminder will show up once a day and won't disappear until you close it by clicking the "x" icon (Figure 24 below, at the bottom of the screen).

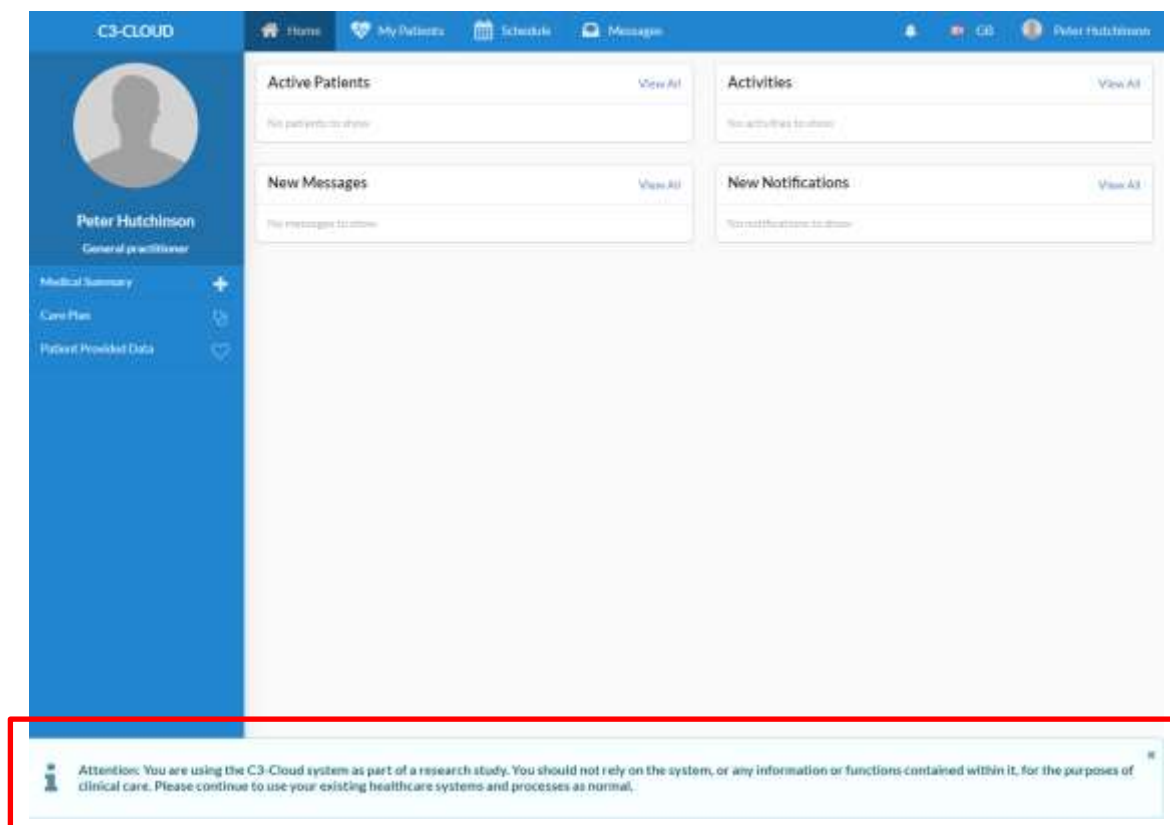


Figure 24. Home Screen of C3-Cloud System

On the right-top corner of the screen, there is a button with the profile picture and name of the user. Click on this button and a menu will appear with "Help", "Change Password" and "Logout" options (Figure 25).

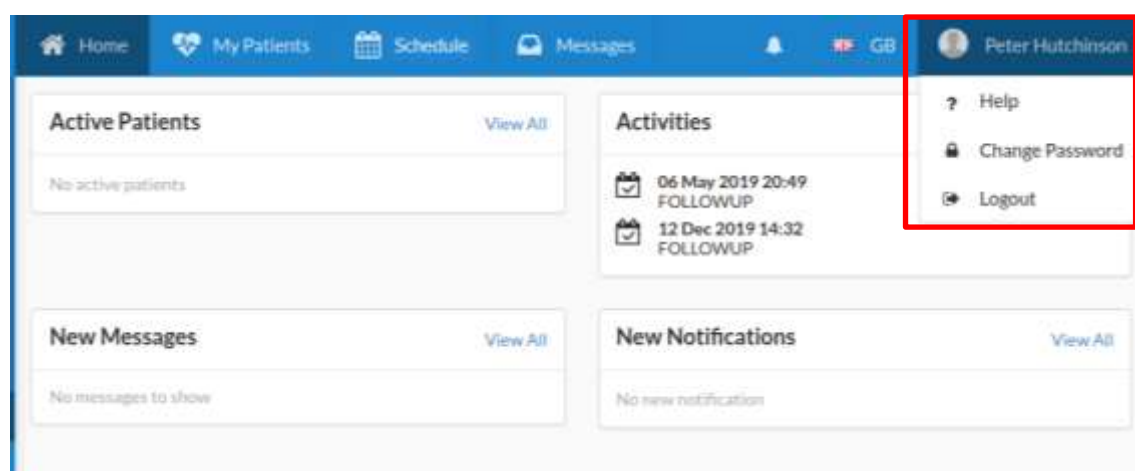


Figure 25. Account Menu

If you click the “Help” option, you will be prompted to download the user guide (Figure 26). Click download if you want to save it to your computer.



Figure 26. Download User Guide

Another option is “Change Password”. Click this option and you will be redirected to the security and privacy suite in a new tab (Figure 27). You can change your account’s password from this page.

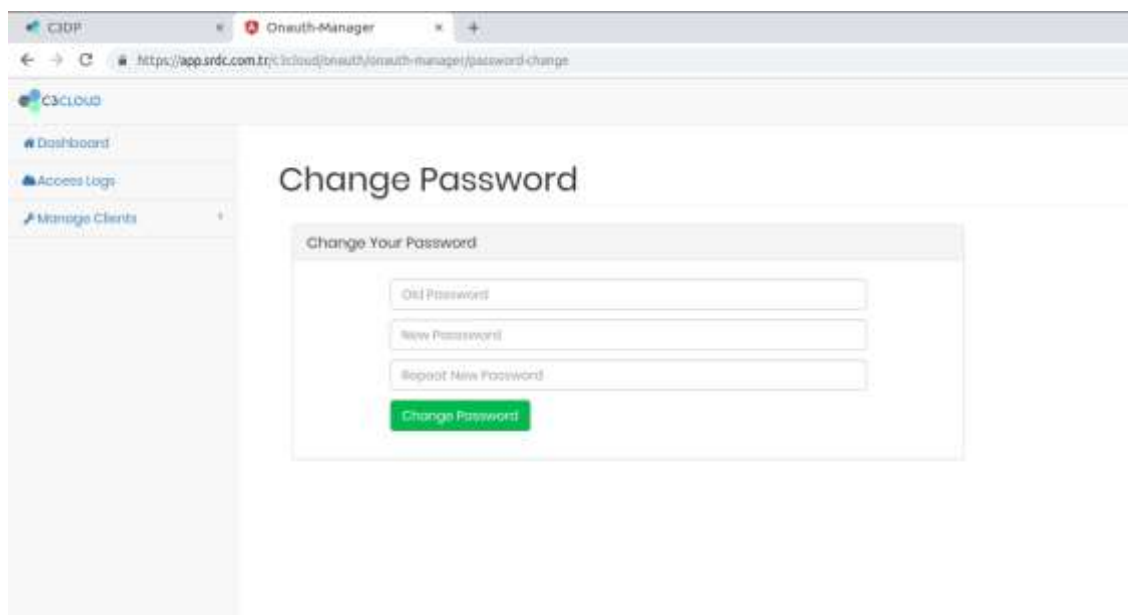


Figure 27. Change Password

Listing patients with active care plans

Click on ‘My Patients’ tab from the top menu. In this ‘My Patients’ page, you can straightaway see all of your patients that already have a care plan that include you as a member of the care team (Figure 28 below).

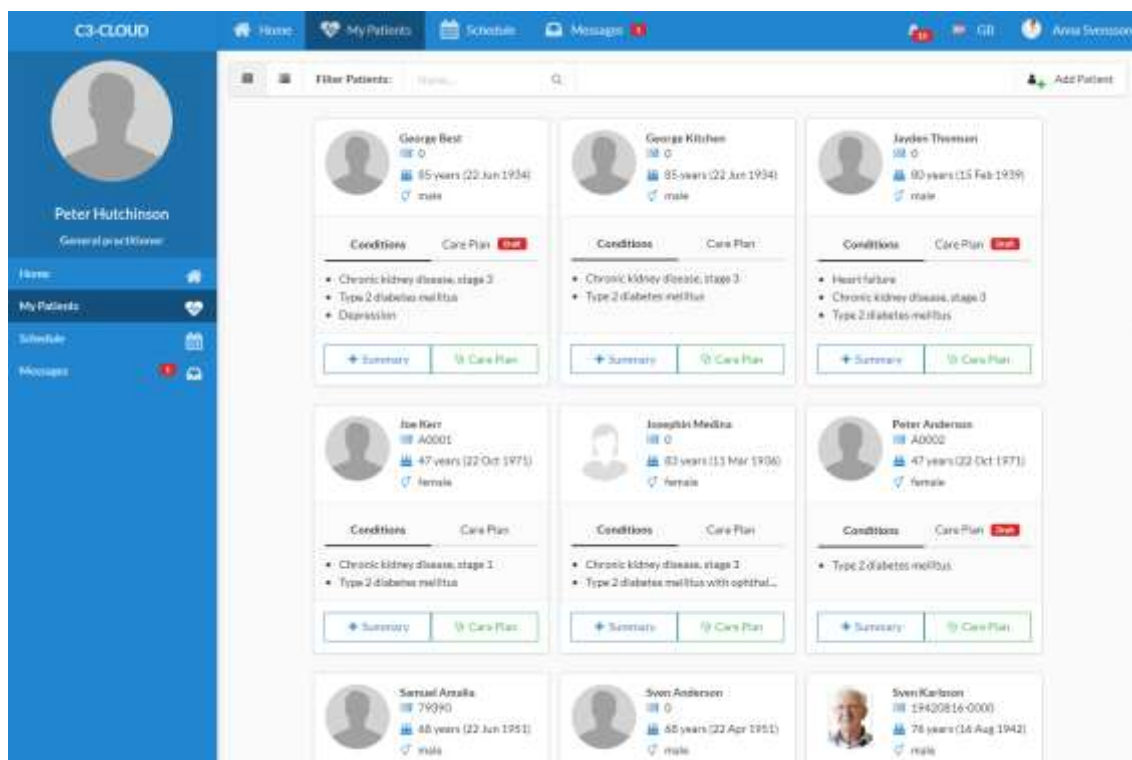


Figure 28. All your patients with a care plan

Each patient is shown in a 'card'. In this card, only the patient's major diseases that are targeted by the C3-Cloud project (i.e. type 2 diabetes, chronic kidney disease, heart failure and depression) are listed. You can navigate to the patient's care plan details or the patient's medical summary by clicking on the 'Care Plan' and 'Summary' buttons respectively on the patient card.

In the same screen, you can also do the following:

- switch between viewing the patients in a card view and list view (Figure 29 below – Red box 1)
- filter the list of patients that already have a care plan by typing e.g. the name of a patient (Figure 29 below – Red box 2)
- search among other patients where you are not currently involved in their care team (where there is a legitimate right to do so) by clicking the 'Add Patient' button (Figure 29 below – Red box 3). This will provide a list of all patients who are registered in the system. You can then, either initiate a care plan (if one doesn't exist already) by clicking the 'Create' button, as shown in Figure 30 below, or request to join the care team of that patient (if there is already an active care plan of the patient) by clicking the 'Join' button.

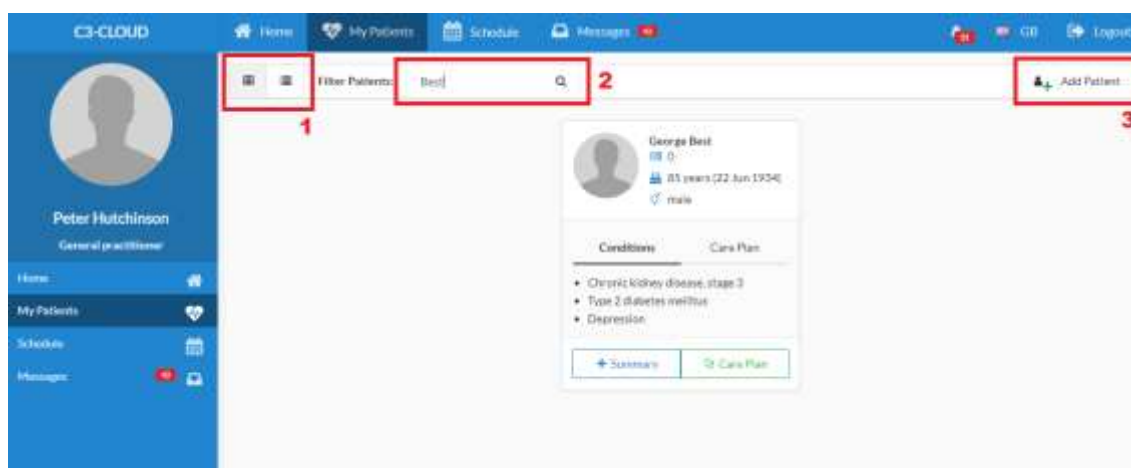


Figure 29. Active patients menu functionalities

Initiating a Patient Care Plan from Scratch

Searching for the Patient

If the patient doesn't already have a care plan and is not listed in the 'My Patients' view, you will need to find the patient using the search bar at the top of the screen or using the 'Add Patient' function. When you have found the patient, click the 'Create' button to start creating the care plan (Figure 30) as explained above.

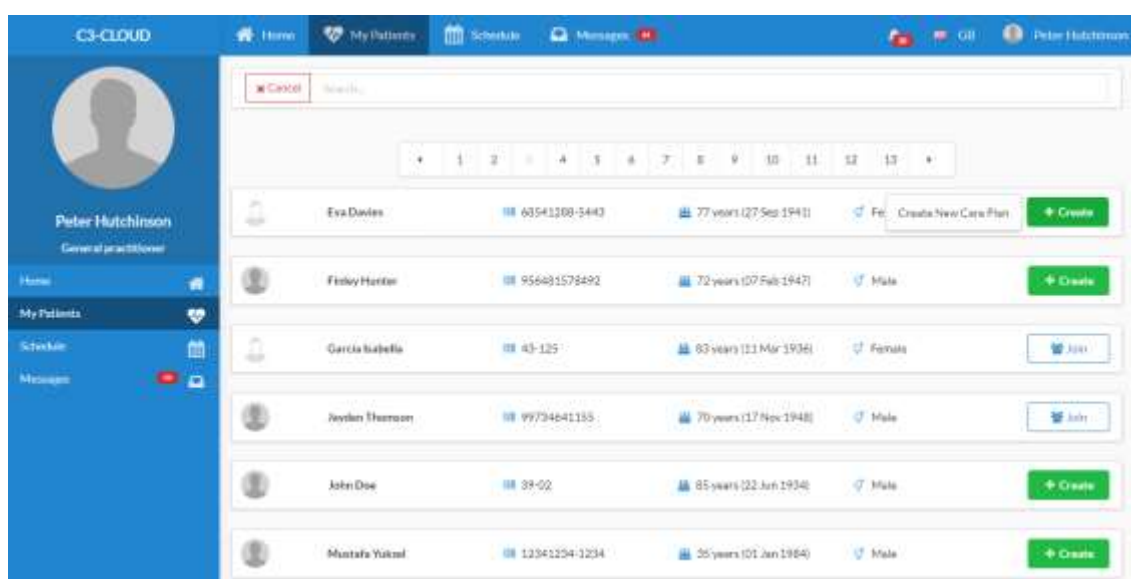


Figure 30. Searching for patients in the C3-Cloud system

Reviewing Medical Summary

After selecting the patient and clicking the 'Create' button, you will be asked to review the medical summary of the patient before initiating the care plan (Figure 31). In this screen, you can see conditions, medications, procedures, encounters, allergies, laboratory results, vital signs, risks and care barriers of your patient grouped as sections.

C3-CLOUD Home My Patients Schedule Messages

Medical Summary of George Best

Last Data Retrieval from the Local EHR System: 02 Aug 2018 12:35

Please review the medical summary and click Continue to proceed. [Continue](#)

George Best
Patient
Age: 64 (22 Jun 1954)
Gender: male
E-mail: george.best@nhs.uk
Phone: (078) 911 1111
Address: 1 The Street A Town, GRAA11 3AA (home)

Medical Summary

Conditions

Diagnosis	Date	Status
Depression	06 Jan 2019	Active
Mild cognitive impairment	01 Aug 2018	Active
Chronic kidney disease stage 3	01 Jan 2018	Active
Prostate Cancer	02 Oct 2010	Active
Type 2 diabetes mellitus	02 Apr 2010	Active
Glaucoma	04 Mar 1998	Active
Hypertension	02 Mar 1999	Active
Hypothyroidism	10 Mar 1987	Active
Osteoarthritis of hand	15 Jul 2014	Inactive
Cardiac infarction	01 Dec 2012	Inactive

Medications

Product	Dose	Frequency	Commenced
Glucoside	80 milligram	1 times per 1 day	01 May 2018
acetylsalicylic acid	75 mg	1 times per 1 day	10 Nov 2012
Metformin	500 milligram	2 times per 1 day	01 Oct 2010
Fraxiparin	1 milligram	1 times per 1 day	04 Aug 2010
tamoxifen	0.4 mg	1 times per 1 day	03 Feb 2008
latanoprost	55 ug	1 times per 1 day	16 Feb 2004
Tinidazole	0.25 %	1 times per 2 day	15 Aug 1998
Atorvastatin	40 milligram	1 times per 1 day	02 Apr 1998
Abacavir	30 milligram	1 times per 1 day	03 Aug 1994
Bandrolumab	2.5 milligram	1 times per 1 day	01 Sep 1993

Allergies

Allergy	Reaction	Onset
Penicillin with extended spectrum	Rash	19 Mar 1994

Procedures

Procedure	Date
-----------	------

Encounters

Encounter	Duration	Place
-----------	----------	-------

Care Barriers [Add](#)

Figure 31. Review Medical Summary

The patient data in this screen are retrieved from your electronic health record systems that have been integrated with the C3-Cloud system. In SWFT the data is extracted on a weekly basis from the EMIS system at Rother House and the SWFT Lorenzo and Community EMIS systems, and imported into the C3-Cloud system. The date that data was last updated for the selected patient from the local EHR/EMR systems is written at the top right corner of the screen next to 'Last Data Retrieval from the Local EHR System' label (as circled in red in Figure 31 above).

NB: It is possible for healthcare professionals to add data to the system in a later step as explained in Section 0 but data which is brought over from the local healthcare systems cannot be overwritten. However, it is not possible to add or change data via the Medical Summary Screen. Please contact your local project co-ordinator if you discover any errors in the data.

Important Note: The patient data you see in this medical summary view might not be complete when compared to the original records of the patient in your own EHR/EMR systems. This is due to the limited integration that has been achieved with the local healthcare systems in your organisation.

On the Medical Summary screen, where suitable data has been provided from your organisations healthcare records systems, you can view quantified observations such as laboratory results and vital signs in chart form, as circled in red in Figure 32 below). To do that, please click on the row of the observation you want to view in chart form. In this case, click the Blood pressure panel under the Vital Signs tab in the Observations section

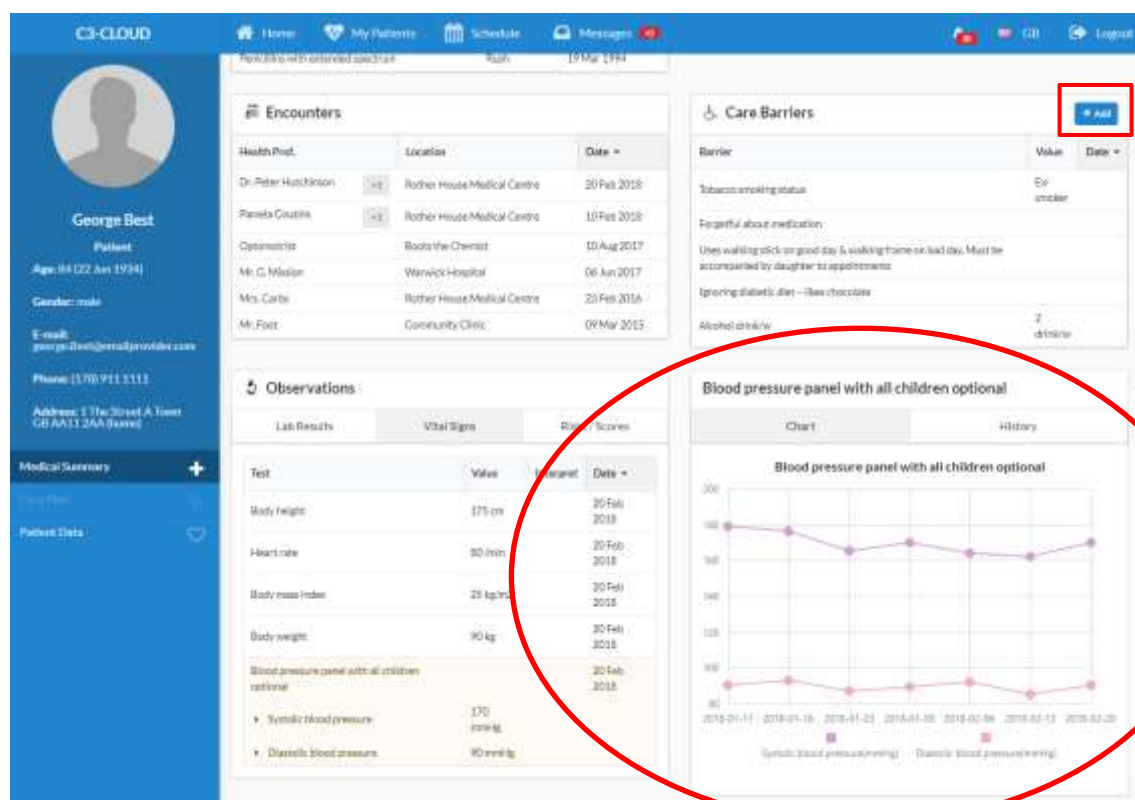


Figure 32. Blood Pressure observations over time

Apart from the measurable observations, you can also add some care barrier information manually. Click on the “Add” button next to the “Care Barriers” title (Figure 32). You will be prompted to provide the care barrier and a value if applicable (Figure 33). Fill the appropriate fields and click the “Add” button to save it.

The screenshot shows the 'Add New Care Barrier' form. It has a 'Barrier' field with the text 'Patient refuses all blood transfusion and administration of primary blood components and minor fractions'. Below it is a 'Value' field, which is currently empty. At the bottom right, there are two buttons: 'Cancel' (red) and 'Add' (blue).

Figure 33. Add New Care Barrier

Care Plan Metadata

After checking the medical summary, click the ‘Continue’ button at the top of the ‘Medical Summary’ screen. You will be prompted to give the care plan a title, then a form will be shown to set the high level details of the care plan (Figure 34).

George Best
Patient
Age: 64 (22 Jun 1934)
Gender: male
E-mail: george.best@nhs.uk
Phone: (178) 911 1111
Address: 1 The Street A Town, GLAAT1 2AA (Home)

Create New Care Plan

Title: New Care Plan

Diseases

☐ Heart failure
☒ Chronic kidney disease
 Chronic kidney disease stage 3
☒ Type 2 diabetes
☐ Depression

Import Existing Medications

<input checked="" type="checkbox"/>	Medication	Start Date	Dose	Frequency
<input checked="" type="checkbox"/>	acetylsalicylic acid	10 Nov 2012	75 mg	1 times per 1 day
<input checked="" type="checkbox"/>	Timolol	15 Aug 1998	0.25 %	1 times per 2 day
<input checked="" type="checkbox"/>	levothyroxine sodium	01 Apr 1987	100 ug	1 times per 1 day
<input checked="" type="checkbox"/>	tamoxifen	03 Feb 2008	0.4 mg	1 times per 1 day
<input checked="" type="checkbox"/>	Atorvastatin	02 Apr 1998	40 milligram	1 times per 1 day
<input checked="" type="checkbox"/>	Finasteride	04 Aug 2010	5 milligram	1 times per 1 day
<input checked="" type="checkbox"/>	Aterolol	03 Aug 1994	30 milligram	1 times per 1 day
<input checked="" type="checkbox"/>	Bendroflumethiazide	01 Sep 1993	3.5 milligram	1 times per 1 day
<input checked="" type="checkbox"/>	Gliclazide	03 May 2015	80 milligram	1 times per 1 day
<input checked="" type="checkbox"/>	latanoprost	15 Feb 2004	35 ug	1 times per 1 day

Figure 34. Care Plan creation form

Give a title to the care plan, such as “T2D/RM Care Plan” and click ‘Continue’. On the next page you will be asked to check/set the major medical conditions that will be addressed in this care plan. In C3-Cloud, the four major conditions that are targeted are Type 2 diabetes, Chronic kidney disease, Heart failure and Depression. If there is coded data from the patient’s medical summary matching with any of these conditions, they will be automatically checked. However, if the patient DOES have conditions which are NOT checked you can select them manually.

The care plan will be created based on a template that will be generated according to the selected diseases and will be linked to the appropriate Clinical Decision Support (CDS) services, so it is important that the major conditions of the patient are set correctly. This selection can be updated later as well through the ‘Care Plan Preferences’ section (see 3.5.10).

You will also see the list of patient’s active medications. You can select the medications to be imported into the care plan automatically from this list (Figure 34). All medications are preselected for you but can manually de-select them if you don’t want to bring them through to the care plan. Again, medications are used by the CDS function. Once medications are selected, they will be shown as ‘Activities’ in the Care Plan, i.e. an activity to take the medication.

Next, you will need to select the members of the care team. When you are creating a care plan from scratch, you are automatically shown on this screen as a care team member and will be assigned as the care plan manager (Figure 35 below). However, if this is not correct then it will need to be updated at a later stage (once other members have joined the team) to reflect the actual care plan manager.

The screenshot shows the C3-Cloud interface for a patient named George Best. The left sidebar contains the patient's profile information: Name (George Best), Age (54), Gender (male), Email (george.best@provident.com), Phone (1776 911 1111), and Address (1 The Street, A Town, CA 94111, USA). The main area displays a list of medications with checkboxes, dates, dosages, and frequencies. Below the medication list is the 'Care Team' section, which includes a search field, a list of team members (Peter Hutchinson), and a 'Set as manager' toggle. A green 'Create & Continue' button is at the bottom.

Medication	Date	Dosage	Frequency
<input checked="" type="checkbox"/> Timolol	15 Aug 1998	0.25 %	1 times per 1 day
<input checked="" type="checkbox"/> levosthrovine sodium	01 Apr 1987	100 ug	1 times per 1 day
<input checked="" type="checkbox"/> tamoxifen	03 Feb 2008	0.4 mg	1 times per 1 day
<input checked="" type="checkbox"/> Abiraterone	02 Apr 1998	40 milligram	1 times per 1 day
<input checked="" type="checkbox"/> Finasteride	04 Aug 2010	5 milligram	1 times per 1 day
<input checked="" type="checkbox"/> Atenolol	08 Aug 1994	30 milligram	1 times per 1 day
<input checked="" type="checkbox"/> Bendroflumethiazide	01 Sep 1993	2.5 milligram	1 times per 1 day
<input checked="" type="checkbox"/> Glucoside	01 May 2015	80 milligram	1 times per 1 day
<input checked="" type="checkbox"/> latanoprost	14 Feb 2004	35 ug	1 times per 1 day
<input checked="" type="checkbox"/> Metformin	01 Oct 2010	800 milligram	2 times per 1 day
<input checked="" type="checkbox"/> Lisinopril	02 May 1992	10 milligram	1 times per 1 day

Figure 35. Care Team assignment

Click the search field under “Add New Member” title (Figure 36 below), start writing the name of the health professional or social care worker to be added. When found, click on the name so that the name and role is added (Figure 36 below). NB: only professionals who are registered in the C3DP system will be available to select. Other professionals can be added by creating a C3DP account for them.

The screenshot shows the 'Add New Member' section of the Care Team. A search field contains the text 'Jack'. Below the search field, a dropdown menu shows 'Jack Mahto' with the role 'Diabetic: insulin nurse'. The 'Role' dropdown is set to 'Family medicine specialist'. The 'Manager' toggle is turned on, and the 'Set as manager' button is visible. A red 'Remove' button is also present. A green 'Create & Continue' button is at the bottom.

Figure 36. Care Team assignment - Search and add a colleague

Check that they have been added to the care team (Figure 37 below).

The screenshot shows a 'Care Team' management interface. At the top, there's a search bar labeled 'Search'. Below it, two team members are listed:

- Peter Hutchinson**: Role is 'Family medicine specialist'. A 'Manager' toggle is turned on. There is a 'Set as manager' link and a red 'Remove' button.
- Jack Mahto**: Role is 'Diabetic liaison nurse'. A 'Manager' toggle is turned off. There is a 'Set as manager' link and a red 'Remove' button.

At the bottom of the interface is a large green button labeled 'Create & Continue'.

Figure 37. A colleague is added to the Care Team

If the role/speciality of the selected health professional is known in the C3-Cloud system (e.g. diabetic liaison nurse), their role field will be automatically filled. You can update this field if required.

At this stage, it is possible to change the Care Plan Manager. **Please note that there can only be a SINGLE Manager of the care plan.** Click “Create & Continue” button to proceed to creating the care plan.

Care Plan Management

The main screen that will be used by the care team members is the care plan management module of the C3-Cloud system (Figure 38 below). The user can track and update a patient’s progress with assigned goals and activities or create new ones. Clinical Decision Support (CDS) services are also integrated in this module to help the care team member in the management of the care plan by suggesting, creating or cancelling some goals, activities e.g. medication requests, lab test requests, referral to a specialist, the next planned appointment, etc.) and education materials for the patients.

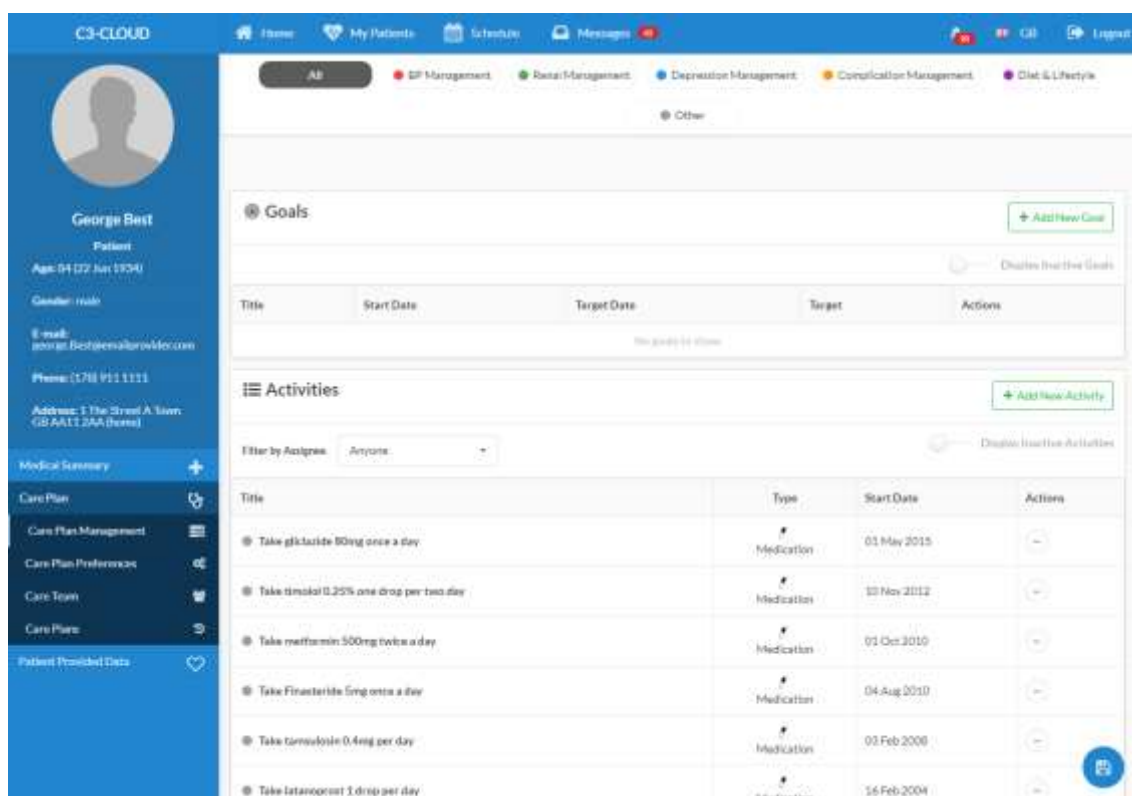


Figure 38. Care Plan View

In Figure 38, as the care plan is newly created, no goals or education materials have yet been added to the care plan of the patient. However, in a brand-new care plan, activities related to the patient's existing medications will be shown if you selected to import them when initializing the care plan (Figure 34).

High-Level Goals and Patient Data Sections

The goals, activities and education materials in an integrated care plan are grouped under a series of 'high-level goals' in the C3-Cloud system. These high-level goals are defined according to the main sub-sections of the chronic disease management clinical guidelines. The high level goals include e.g. blood pressure management, complication management, blood glucose management, diet & lifestyle management (as circled in Figure 39 below).

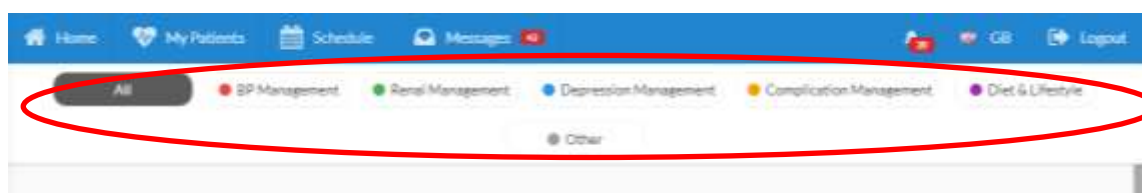


Figure 39. High-Level Goals

Each tab at the top of the Care Plan screen as shown in Figure 39 refers to a high-level goal, except the first one ('All') which enables the listing of all goals, activities and education materials in the care plan in a holistic list. The last one ('Other') is kept for any goal, activity or education material that does not belong to a high-level goal which has been pre-defined, e.g. glucose management and diet & lifestyle management.

By clicking one of the pre-defined high level goals (excluding ‘All’ and ‘Other’) before adding goals, activities or training materials to the care plan, the Clinical Decision Support (CDS) function in the system is able to make suggestions for goals, activities and training materials which may be relevant to the patient based on evidence based guidelines. This is explained further below.

Each of these pre-defined high-level goals (except ‘All’ and ‘Other’) has one or more CDS services associated with it. In order for the CDS services to work and make suggestions or recommendations, each high level goal has a clinical dataset associated with it. As an example, Figure 40 below shows the dataset that is required to support the CDS services under the BP Management high level goal.

These datasets must be checked by the care team member to ensure that the data is accurate and can support reliable CDS suggestions.

Some of these clinical data items may already have been added from the local health records systems. In that case, the user is not able to alter the value. For the remaining data items, the user can update the values with recent data, as some data might be missing or out of date in the local systems.

Underneath the patient data section, the goals, activities and education materials associated with the corresponding high-level goal are listed. Colour coding is implemented as well to highlight the association of goals, activities and education materials to a particular high-level goal. A goal, activity or education material can only be assigned to a single high-level goal, and this assignment can be updated at any time.

As an example, in Figure 40 below, the ‘BP Management’ high-level goal is selected and in the ‘BP Management Related Patient Data’ section at the top, it can be seen that the patient already has a history of “Cardiovascular Disease”, “Hypertension”, “Type 2 diabetes” and recent BP measurements are quite high: 170/90 mmHg. You can also see the onset/assertion dates for the related data at the same row.

The screenshot displays the 'BP Management Related Patient Data' section for a patient named George Best. The interface includes a sidebar with navigation options like 'Medical Summary', 'Care Plan', and 'Patient Provided Data'. The main content area displays various clinical data fields categorized into Conditions, Medications, Lab Results, and Vital Signs. The 'Conditions' section lists Chronic kidney disease, Hypertension, Type 2 diabetes, and Type 2 diabetes with their respective onset dates. The 'Medications' section lists Beta blocker, Calcium blocker, and Thiazide diuretics. The 'Lab Results' section shows aGFR, Albumin / Creatinine, and Potassium levels. The 'Vital Signs' section shows Systolic and Diastolic blood pressure readings. A 'Goals' section is visible at the bottom.

Figure 40. BP Management Related Patient Data

These high-level goal related patient data sections will be fully open when a care plan is being created for the first time, to catch the attention of the health professionals. However, once initial care plan creation is complete and the care plan has been activated and shared with other care team members and the patient, then the high-level goal related patient data sections will be ‘collapsed’ by default, i.e. hidden at first look, as shown in Figure 41 below. The dataset can be opened again at any time by clicking anywhere in the section label (as circled in red).

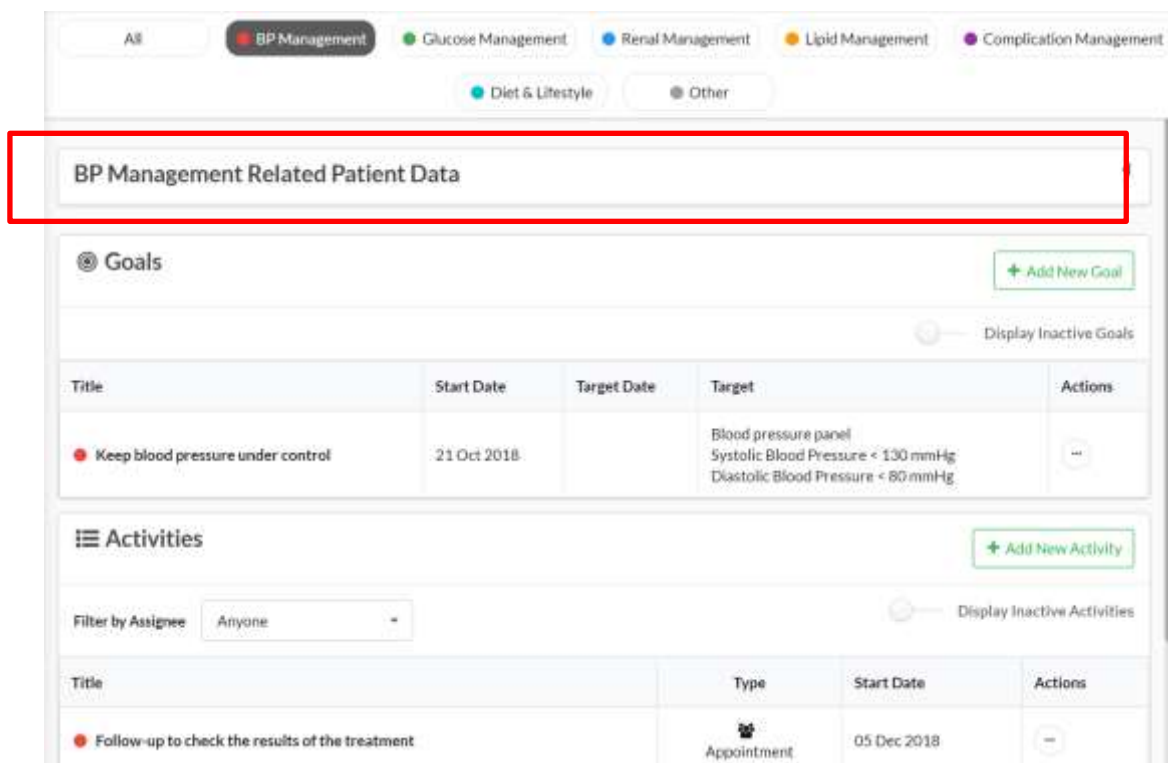


Figure 41. Collapsed view of BP Management Related Patient Data

Adding / updating a goal

Adding goals suggested by the Clinical Decision Support Services

Once you have selected a high-level goal (e.g. BP Management in Figure 40), click on the “Add New Goal” button (Figure 42).



Figure 42. Add New Goal Button

This will automatically list any goals which are suggested by the CDS services for you (Figure 43).

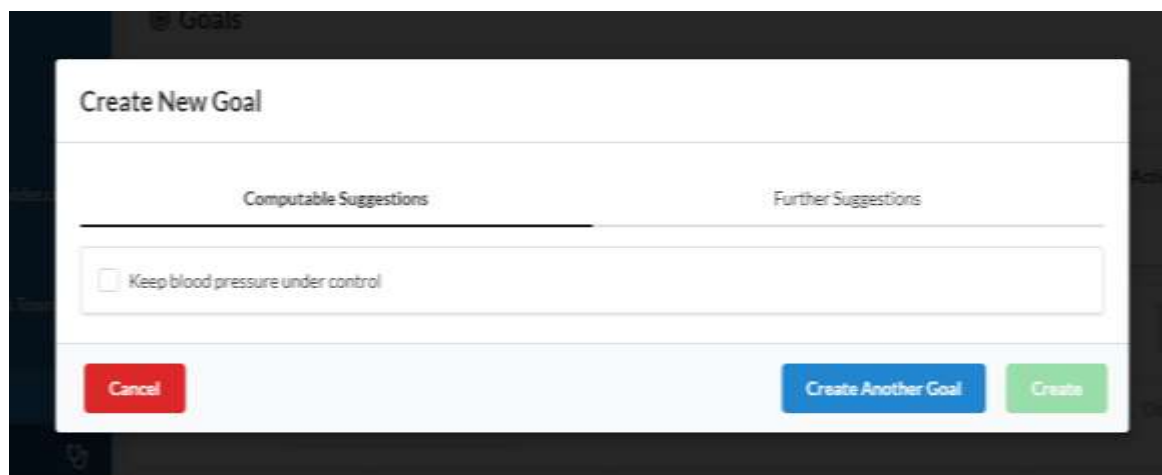


Figure 43. CDS Suggestions for Goals

The suggested Goal is presented in the ‘Computable Suggestions’ tab. There is also another tab named ‘Further suggestions’ which includes verbal suggestions from clinical guidelines, most of the time in the form of reminders (Figure 44 below).

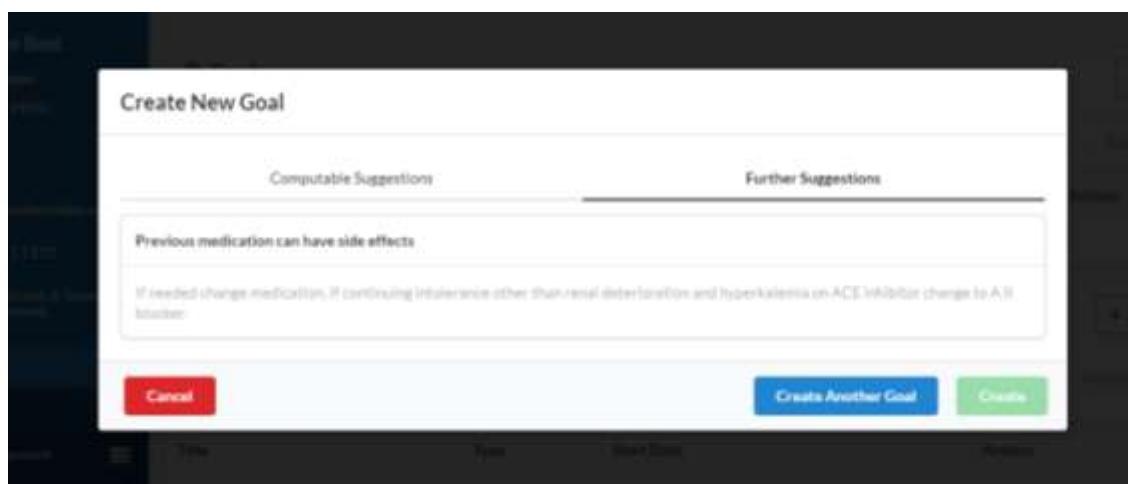


Figure 44. Further Suggestions

From the ‘Computable Suggestions’, tick the box of the goal(s) that you want to add to the care plan and click the green ‘create’ button to proceed.

You will be prompted to check the details of, and if necessary, update each goal you have selected (Figure 45). You will see that the goal is already assigned to the “BP Management” high-level goal and the targets are set as “Systolic Blood Pressure” and “Diastolic Blood Pressure” levels for this specific blood pressure goal.

C3-CLOUD Home My Patients Schedule Messages GB Logout

George Best
Patient
Age: 54 (22 Jun 1934)
Gender: male
E-mail: george.best@emailprovider.com
Phone: (178) 915 1111
Address: 1 The Street A Town GB AA11 2AA (home)

Medical Summary +
Care Plan
Care Plan Management
Care Plan Preferences
Care Team
Care Plans
Patient Provided Data

Keep blood pressure under control
In Progress + (23 Oct 2018) Goal

Peter Hutchinson BP Management

QUANTIFIED TARGET

Target
Blood pressure panel

Systemic Blood Pressure

Quantity
Less Than 130 mmHg

Diastolic Blood Pressure

Quantity
Less Than 80 mmHg

Cancel Save

Figure 45. Blood Pressure targets suggested by the BP Management CDS service

Fill the other required fields on the screen and click save to create the goal (Figure 46Error! Reference source not found.).

C3-CLOUD Home My Patients Schedule Messages GB Logout

George Best
Patient
Age: 54 (22 Jun 1934)
Gender: male
E-mail: george.best@emailprovider.com
Phone: (178) 915 1111
Address: 1 The Street A Town GB AA11 2AA (home)

Medical Summary +
Care Plan
Care Plan Management
Care Plan Preferences
Care Team
Care Plans
Patient Provided Data

Keep blood pressure under control
In Progress + (23 Oct 2018) Goal

Peter Hutchinson BP Management

Details History Feedback

Goal
Keep blood pressure under control

Visible to Patient
Yes No

Description
Keep blood pressure under 130/80 mmHg.

Start Date
23 Oct 2018

Target Date

QUANTIFIED TARGET

Target
Blood pressure panel

Cancel Save

Figure 46. Create Goal Suggested by CDS

Adding goals from scratch (not using the CDS suggestions)

To create a goal from scratch, click the ‘Add New Goal’ button again (Figure 42 above), then click the blue ‘Create Another Goal’ button (Figure 43 above). Note that if you do not select a high-level goal (i.e. you are on the “All” or “Other” tab) or the selected high-level goal doesn’t have a CDS service attached, you will not see the CDS suggestions and be directly navigated to create a goal from scratch (Figure 47).

Figure 47. Create a Goal from Scratch

To add a new goal for e.g. “Decreasing HDL Cholesterol” click on the search field below “Goal” (Figure 47 above – Red box 1) and type a few keywords related to the goal you would like to add (Figure 48 **Error! Reference source not found.**); and select the goal from the list.

The screenshot shows the C3-Cloud interface with a patient profile for George Best. A modal window titled 'Goal' is open, showing a search for 'HDL'. The search results list 'Decrease non-HDL cholesterol' and 'Decrease HDL cholesterol'. The 'Decrease HDL cholesterol' goal is selected, and the 'QUANTIFIED TARGET' section shows 'Target' as 'HDL'.

Figure 48. Create a Goal from Scratch (Search the Goal)

When you select the goal, if there is a quantified target related to it, you will see that it is set automatically. For example, you can see that “Cholesterol in HDL” quantified target is automatically set for the goal “Decreasing HDL Cholesterol” goal (circled in red in Figure 49).

The screenshot shows the C3-Cloud interface with a patient profile for George Best. A modal window titled 'Goal' is open, showing the 'Decrease HDL cholesterol' goal selected. The 'QUANTIFIED TARGET' section shows 'Target' as 'Cholesterol in HDL' (circled in red). The 'Quantity' section shows 'Equals' and 'mg/dL'.

Figure 49. Create a Goal from Scratch (Goal Target)

When a goal is selected from the list, the title of the goal at the very top of the screen is automatically set. If you are not able to find the goal that you would like to create in the predefined list of goals as shown above, you can create a new goal by selecting nothing from the predefined list and typing your own title for the goal, at the very top of the screen (as circled in blue above).

If you think the goal that you want to create belongs to one of the high-level goals, you can select it from the “Select Related Goal” dropdown menu or set it to ‘Other’ (Figure 47 **Error! Reference source not found.**– Red box 2). If you wish the goal to be visible for the patient in the PEP system, you should set the ‘Visible to Patient’ field to “Yes” (Figure 47– Red box 3). If this is a goal to be reviewed only by care team members, set it to “No”. This is a mandatory data item which must be completed.

Then, set the other fields as appropriate and click save when you are done. The goal will be added to the care plan (Figure 50 **Error! Reference source not found.**).

The screenshot shows the C3-Cloud interface for a patient named George Best. The left sidebar contains patient information and a menu. The main area displays the 'Goals' section, which is highlighted with a red box. Below the 'Goals' section is the 'Activities' section.

Patient Information:

- Name: George Best
- Age: 64 (22 Jun 1934)
- Gender: male
- E-mail: george.best@emailprovider.com
- Phone: (170) 911 1111
- Address: 1 The Street A Town, GR AA11 3AA (Home)

Goals Table:

Title	Start Date	Target Date	Target	Actions
Decrease HDL cholesterol	21 Oct 2018	21 Nov 2018	Cholesterol in HDL > 50 mg/dL	[-]
Keep blood pressure under control	21 Oct 2018		Blood pressure panel Systolic Blood Pressure < 130 mmHg Diastolic Blood Pressure < 80 mmHg	[-]

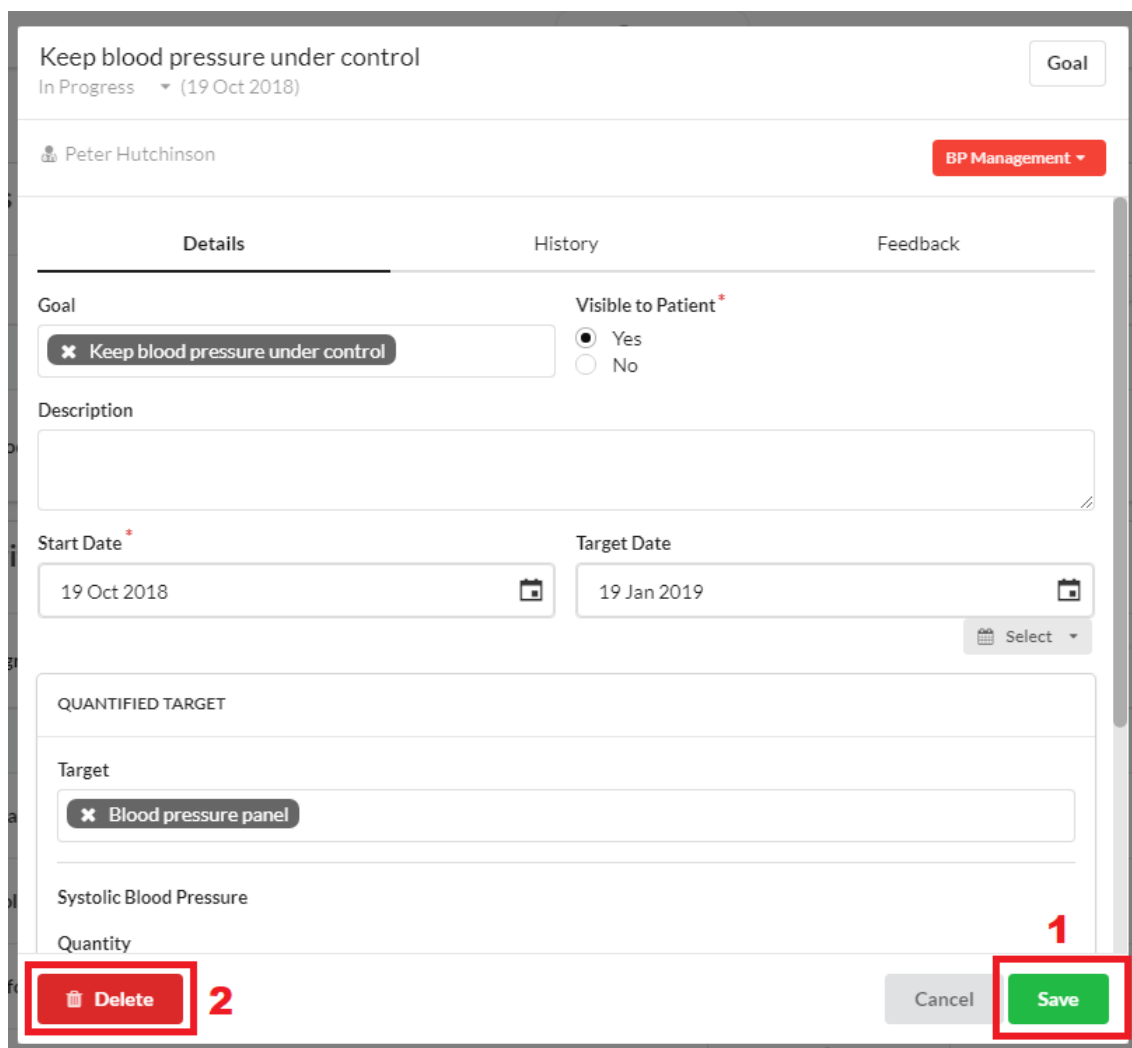
Activities Table:

Title	Type	Start Date	Actions
Take glimepiride 60mg once a day	Medication	01 May 2015	[-]
Take metformin 500mg twice a day	Medication	01 Oct 2010	[-]
Take furosemide 50mg once a day	Medication	04 Aug 2010	[-]

Figure 50. New goal is added in the care plan

Updating an Existing Goal

To edit a previously created goal, click on the relevant row of the goals table. The form which will appear is the same as the goal creation form but with the previously filled fields (Figure 51 below). Make any required changes such as giving a detailed description, etc. and the save button will be active (Figure 51 below - Red box 1). You can also delete the goal using the “Delete” button at the left bottom corner (Figure 51 below - Red box 2).



Keep blood pressure under control

In Progress (19 Oct 2018)

Peter Hutchinson

BP Management

Details History Feedback

Goal

Visible to Patient *

Keep blood pressure under control

Yes

No

Description

Start Date *

19 Oct 2018

Target Date

19 Jan 2019

Select

QUANTIFIED TARGET

Target

Blood pressure panel

Systolic Blood Pressure

Quantity

Delete

Cancel

Save

Figure 51. Review Goal Screen

Adding / updating an Activity

Adding activities suggested by CDS

Select a high-level goal tab, such as “BP Management”, if it isn’t already selected, and click the ‘Add New Activity’ button (Figure 52 below).



Activities

Filter by Assignee

Anyone

Display Inactive Activities

Add New Activity

Figure 52. Add New Activity Button

Just like when adding goals, you will first see the activities suggested by CDS Services in a personalized manner as shown in Figure 53 below (except if you have selected ‘All’ or ‘Other’ as the high level goal). In this example, the CDS Services suggest prescribing an ACE inhibitor. In addition, a control appointment is proposed, and the patient is advised to measure their BP before the next visit. Select the activities you judge as relevant to add them to the care plan and click the green ‘Create’ button.

Important Note: The recommendations from the CDS services are personalised suggestions for a patient according to the selected clinical guidelines in the C3-Cloud project. The health professional(s) are the ultimate authority to plan the care of a patient based on their experience, so it is not mandatory to strictly follow the suggestions in the C3-Cloud system. Also, the C3-Cloud system is in the trial phase at the moment, and any of its recommendations should be treated with caution.

The screenshot shows the 'Add Activity' window with two tabs: 'Computable Suggestions' (active) and 'Further Suggestions'. Under 'Personalized Suggestions', there is a section titled 'ACE inhibitor recommendation' with the text 'Add Angiotensin Converting Enzyme Inhibitor, Blood pressure check(1-2 months interval) and Followup appointment'. Below this, a box titled 'ACE inhibitor Prescription and Followup appointment' contains three items, each with a checked checkbox and a label on the right:

- ☒ ACE Inhibitor Prescription (Medication)
- ☒ Follow-up to check the results of the treatment (Appointment)
- ☒ Blood pressure panel (Patient Order)

At the bottom of the window, there are three buttons: 'Cancel' (red), 'Create Another Activity' (blue), and 'Create' (green).

Figure 53. Adding a new Activity: suggestions by CDS services

After clicking 'Create', you will be asked to fill the details of each selected activity (Figure 54, Figure 55, Figure 56 below) in the selected order. Change the fields as appropriate and click 'Save' to save them to the care plan.

The screenshot displays the C3-Cloud application interface. On the left, a sidebar shows the patient's profile for George Best, including age (84), gender (male), and contact information. The main area features a modal window titled '1/3 ACE Inhibitor Prescription'. This window has tabs for 'Details', 'History', and 'Feedback'. The 'Details' tab is active, showing a form with the following fields: 'Product' (ACE INHIBITORS, PLAIN), 'Route' (Search), 'Dose' (Search), 'Frequency' (Search), and 'Start Date' (21 Oct 2018). There are also buttons for 'Cancel All', 'Cancel', and 'Save'.

Figure 54. ACE Inhibitor Prescription Details

The screenshot displays the C3-Cloud application interface. On the left, the same patient profile for George Best is visible. The main area features a modal window titled '2/3 Follow-up to check the results of the treatment'. This window has tabs for 'Details', 'History', and 'Feedback'. The 'Details' tab is active, showing a form with the following fields: 'Description' (Follow-up to check the results of the treatment), 'Start Date' (05 Dec 2018 23:09), 'End Date' (05 Dec 2018 23:39), 'Type' (FOLLOWUP), and 'Participants' (Peter Hutchinson, George Best). There are also buttons for 'Cancel All', 'Cancel', and 'Save'.

Figure 55. Follow-up Appointment Details

Figure 56. Blood Pressure Observation Self-Measurement Details

Detailed explanations per each activity type will be provided in the following sections.

Adding an activity from scratch (not using CDS services)

When you are in a high-level goal, to create an activity from scratch, click the ‘Add New Activity’ button (Figure 52) and then click ‘Create Another Activity’. If you are in the ‘All’ or ‘Other’ high-level goal or the selected high-level goal doesn’t have a CDS service attached, you will not see the CDS suggestions and will be directly navigated to the create an activity from scratch menu.

There are several types of activities available, e.g. “Patient Order”, “Lab Request”, “Appointment”, etc. You will see all activity types listed when creating an activity from scratch (left hand side on Figure 57 below). Each of them has predefined templates or related resources to speed up the activity creation process.

Figure 57. Create New Activity (Patient Order)

Each activity type listed above is described in more detail below.

- Patient Order

“Patient Order” is a type of activity that will be performed by the patient themselves. You can see the patient order templates listed in Figure 57 above, e.g. “Back Exercise”, “Attend smoking cessation therapy”, etc.

You can either select one of these predefined templates or if you cannot find what you are looking for, click ‘New’ button at the top of the screen to create a brand-new patient order. On selecting, a patient order or clicking the ‘new’ button, the form in Figure below will be shown for completion.

C3-CLOUD Home My Patients Schedule Messages GB Logout

George Best
Patient
Age: 84 (22 Jun 1934)
Gender: male
E-mail: george.Best@emailprovider.com
Phone: (178) 911 1111
Address: 1 The Street A Town GB AA11 2AA (Home)

Medical Summary +
Care Plan +
Care Plan Management
Care Plan Preferences
Care Team
Care Plans
Patient Provided Data

Back exercise Patient Order
In Progress
Peter Hutchinson Other

Details History Feedback

Activity
Back exercise

Description

Timing
From: 21 Oct 2018 To: 21 Nov 2018 Quantity: Quantity Unit: Select

Repeating ☐
Location

Cancel Save

Goals
Title: Decrease
Filter by Assign
Title: Follow-up
ACE Inhibitor Prescription
Medication 21 Oct 2018
ACE Inhibitor Prescription
Medication 21 Oct 2018

Actions
Add New Goal
Display these Goals
Add New Activity
Display these Activities

Figure 58. Patient Order Details

Enter the requested information as appropriate and click Save to add the activity to the care plan.

- Medication

Select the “Medication” activity to prescribe a medication to the patient. You can select a product from the predefined list to initialize the medication request form with the selected product or click “New” for an empty form (Figure 59).

Figure 59. Create New Activity (Medication)

In the predefined list shown in this form, the most widely prescribed products for the C3-Cloud major diseases are shown only. However, inside the detailed medication request form (Figure 60**Error! Reference source not found.**), in the product field, the full list of WHO ATC codes are available for searching and selecting. You can do this by entering the first letters of the product so that a drop down list appears. After selecting the active ingredient of the product, you can set the “Route”, “Dose”, etc. of the medication request and click save to create the medication in the care plan

C3-CLOUD Home My Patients Schedule Messages GB Logout

George Best
Patient
Age: 54 (22 Jun 1934)
Gender: male
E-mail: bnyrgn.best@nhs.uk@nhs.uk
Phone: (178) 911 1111
Address: 1 The Street A Town GB AA11 3AA (Home)

Medication Details

CALCIUM CHANNEL BLOCKERS (Active)

Product: **CALCIUM CHANNEL BLOCKERS** Description:

Route: Dose: Quantity: Unit:

Reactions:

Timing: From: 21 Oct 2018 To:

Cancel Save

Figure 60. Medication Details

When you add a medication, the system will check if there are any drug interaction conflicts. If so, you will be warned about the interactions (Figure 61). The critical interactions are highlighted with red colour. If you click "Modify", you will be back to edit your prescription. If you click "Save Anyway", the interactions will be ignored, and the prescription will be saved.

Interaction	Description
Bendroflumethiazide, Venlafaxine	Bendroflumethiazide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Bumetanide, Venlafaxine	Bumetanide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Chlorothiazide, Venlafaxine	Chlorothiazide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Chlortalidone, Venlafaxine	Chlortalidone is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Clopamide, Venlafaxine	Clopamide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Furosemide, Venlafaxine	Furosemide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Hydrochlorothiazide, Venlafaxine	Hydrochlorothiazide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Hydroflumethiazide, Venlafaxine	Hydroflumethiazide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Indapamide, Venlafaxine	Indapamide is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.
Metolazone, Venlafaxine	Metolazone is predicted to cause hypokalaemia (potentially increasing the risk of torsade de pointes) when given with venlafaxine. Manufacturer makes no recommendation.

Figure 61. Drug Interactions

Important Note: C3-Cloud system is not integrated with your operational prescription system(s), so any medication request made through C3-Cloud will not appear in your existing local systems as an official prescription. Any new medication request made through C3-Cloud has to be repeated by you in your operational prescription system(s).

- Diet

“Diet” activities are used to assign dietary requests to the patient. There is a predefined list of diets by C3-Cloud health professionals as shown in Figure 62. You can either select one of them or click “New” to create another diet request that doesn’t exist in the predefined list (Figure 63).

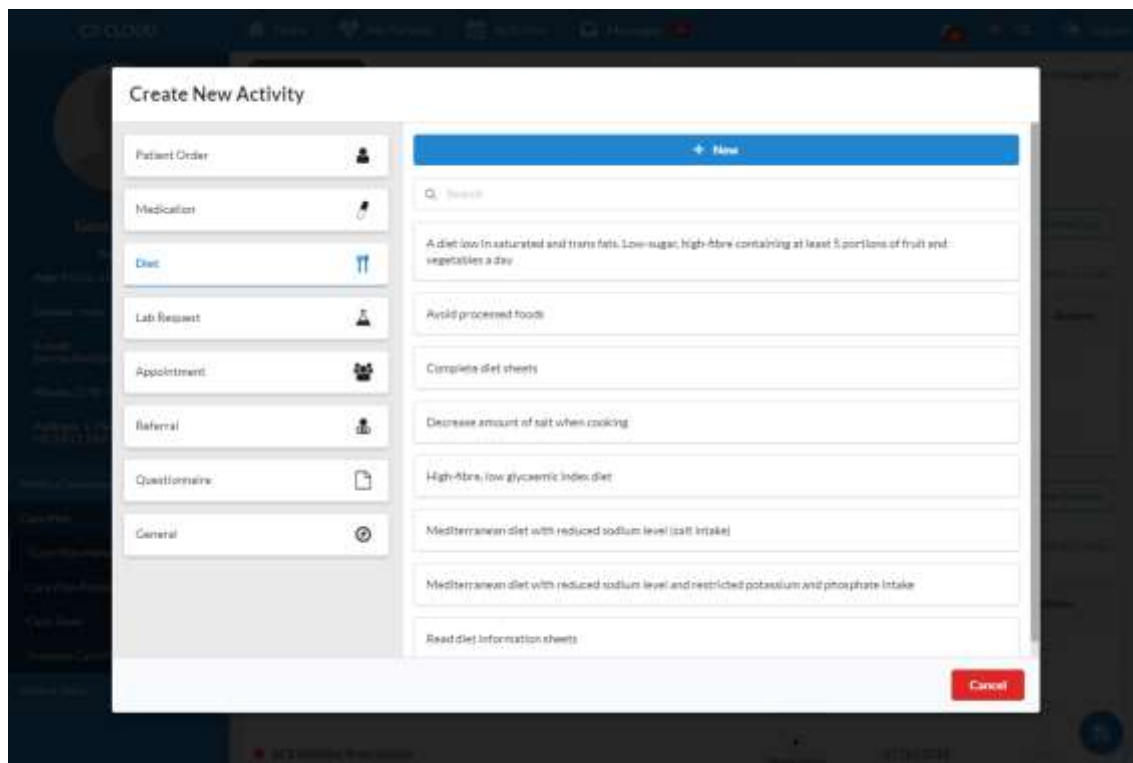


Figure 62. Create New Activity (Diet)

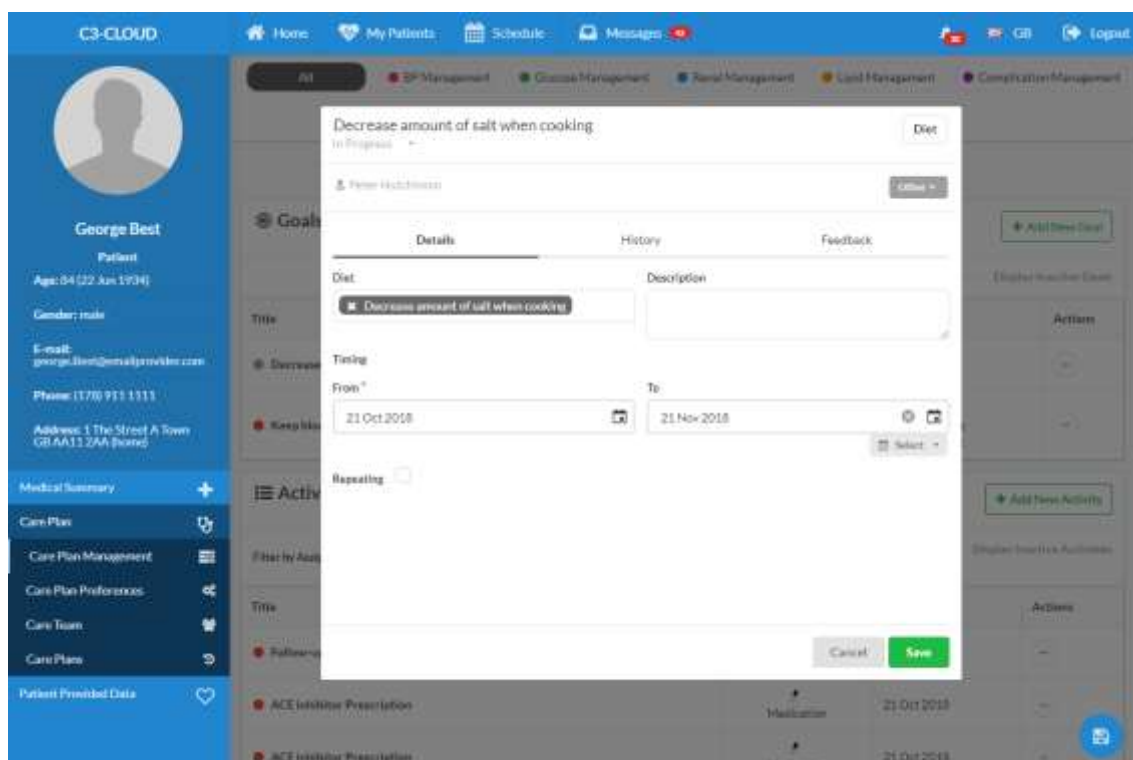


Figure 63. Diet Details

- Lab Request

Select the “Lab Request” option from the “Create New Activity” list and you will see a set of lab tests (Figure 64).

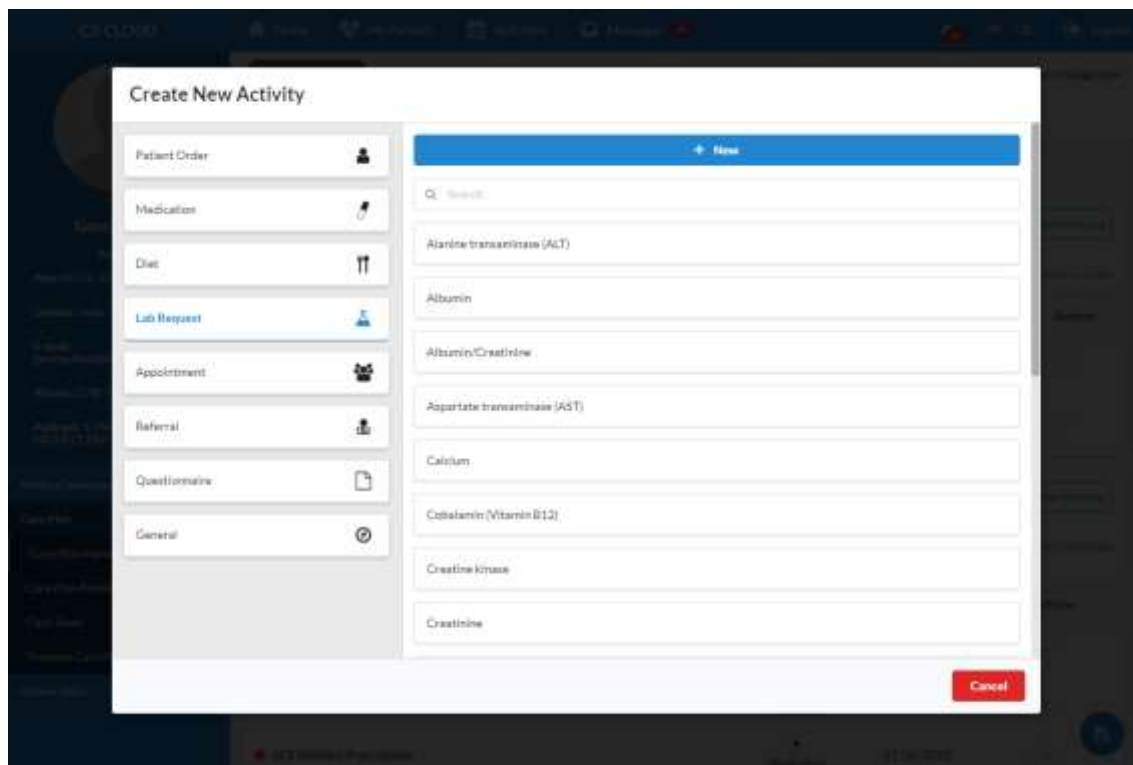


Figure 64. Create New Activity (Lab Request)

This predefined list is again constructed according to the needs of C3-Cloud major diseases and feedback of the C3-Cloud health professionals.

Select the test you want to request from the patient and the form will be shown for completion. See that the patient is already assigned as a performer since he needs to go to a laboratory to perform the test (Figure 65 below). You can add other people, for example a nurse who will do the test, as performers.

The screenshot shows the C3-Cloud interface with a sidebar on the left containing patient information for George Best (Age: 54, Gender: male, E-mail: george.best@provider.com, Phone: (1776) 911 1111, Address: 1 The Street A Town, GB AA11 3AA). The main area displays a 'Lab Request' form for 'Albumin' in progress, assigned to Peter Hutchinson. The form has tabs for Details, History, and Feedback. The 'Details' tab is active, showing fields for Lab Test (Albumin), Date (21 Oct 2018), Reason for Test (Search), and Performer (George Best). There are 'Cancel' and 'Save' buttons at the bottom right of the form.

Figure 65. Lab Request Details

Important Note: the C3-Cloud system is not integrated to any local laboratory order system so lab requests made through C3-Cloud will only stay in C3-Cloud. The lab request will need to be completed using your normal systems.

- Appointment

To set an appointment, click on “Appointment” from the “Create New Activity” list and select the type of the activity from the list (Figure 66).

Figure 66. Create New Activity (Appointment)

The user and the patient will be automatically added as participants (Figure 67). You can update the participants list as you wish. Then, set the start date, end date and location of the appointment and click save to add it to the care plan.

Figure 67. Appointment Details

Important Note: Similarly, C3-Cloud system is not integrated to any operational scheduling system used in your daily work, so appointments made through C3-Cloud will only stay in C3-Cloud. Appointments will need to be arranged using your normal systems.

- Referral

For referring the patient to another health professional, select “Referral” from the list. You will see a list of specialties like “Cardiologist”, “Dermatologist”, “Dietician”, etc. (Figure 68).

The screenshot shows the 'Create New Activity' window. On the left, a sidebar lists various activity types: Patient Order, Medication, Diet, Lab Request, Appointment, Referral (highlighted in blue), Questionnaire, and General. The main panel is titled 'Create New Activity' and features a search bar with the text 'Search'. Below the search bar, a list of specialties is displayed: Cardiologist, Community nurse, Dentist, Dermatologist, Diabetic nurse, Dietician, Endocrinologist, and Footcare protection program. A red 'Cancel' button is located at the bottom right of the form.

Figure 68. Create New Activity (Referral)

Search and select the specialty which you want to refer the patient. In addition to referring to a department, you can also refer him to a named professional by searching from the “Refer To” field (Figure 69). The list of professionals will be filtered by the selected specialty if you don’t remove the filter by clicking ‘x’.

Figure 69. Referral Details

Important Note: C3-Cloud system is not integrated to any operational scheduling/referral system used in your daily work, so referrals made through C3-Cloud will only stay in C3-Cloud. Referrals will need to be completed using your normal systems.

- Questionnaire

It is possible to ask the patient to complete a clinical questionnaire within the system. Select “Questionnaire” from the “Create New Activity” list to create a questionnaire activity to be shared with the patient (Figures Figure 70 and Figure 71). Patients will complete the questionnaire electronically via the C3-Cloud patient system. A number of patient questionnaires for your organisation have already been defined and introduced into the C3-Cloud system and these are the only ones that you will be able to see. You can search and select the questionnaire that you want to assign to the patient.

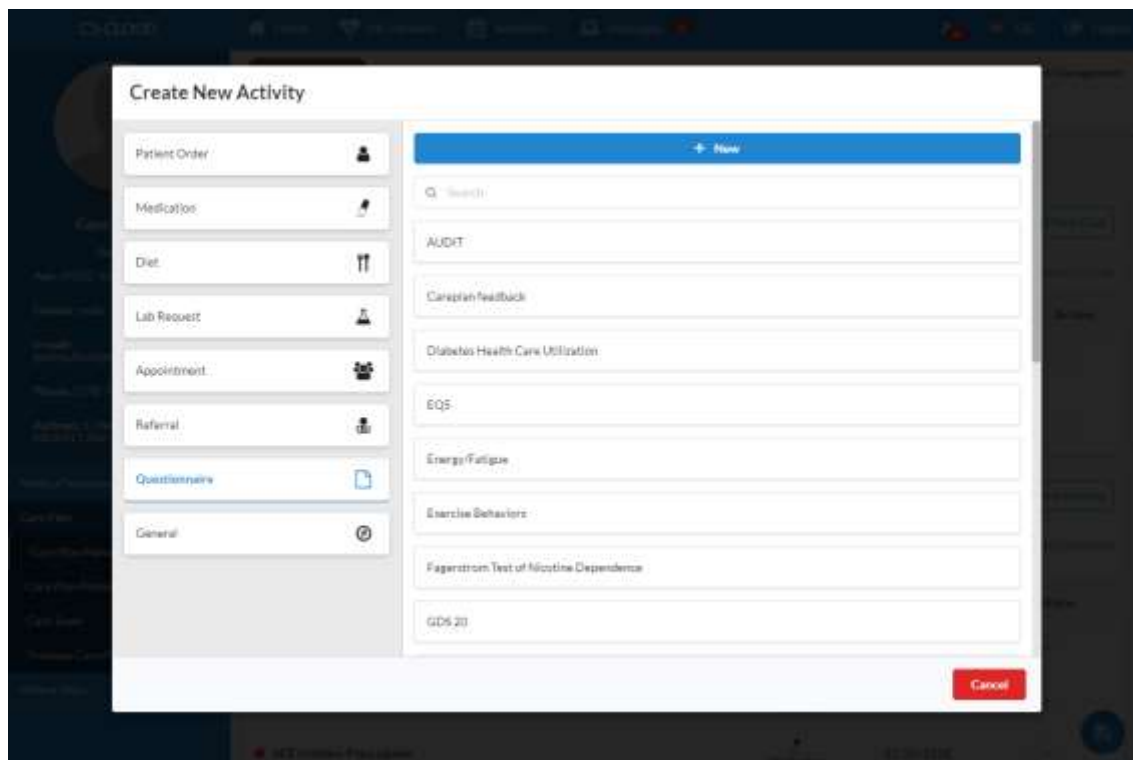


Figure 70. Create New Activity (Questionnaire)

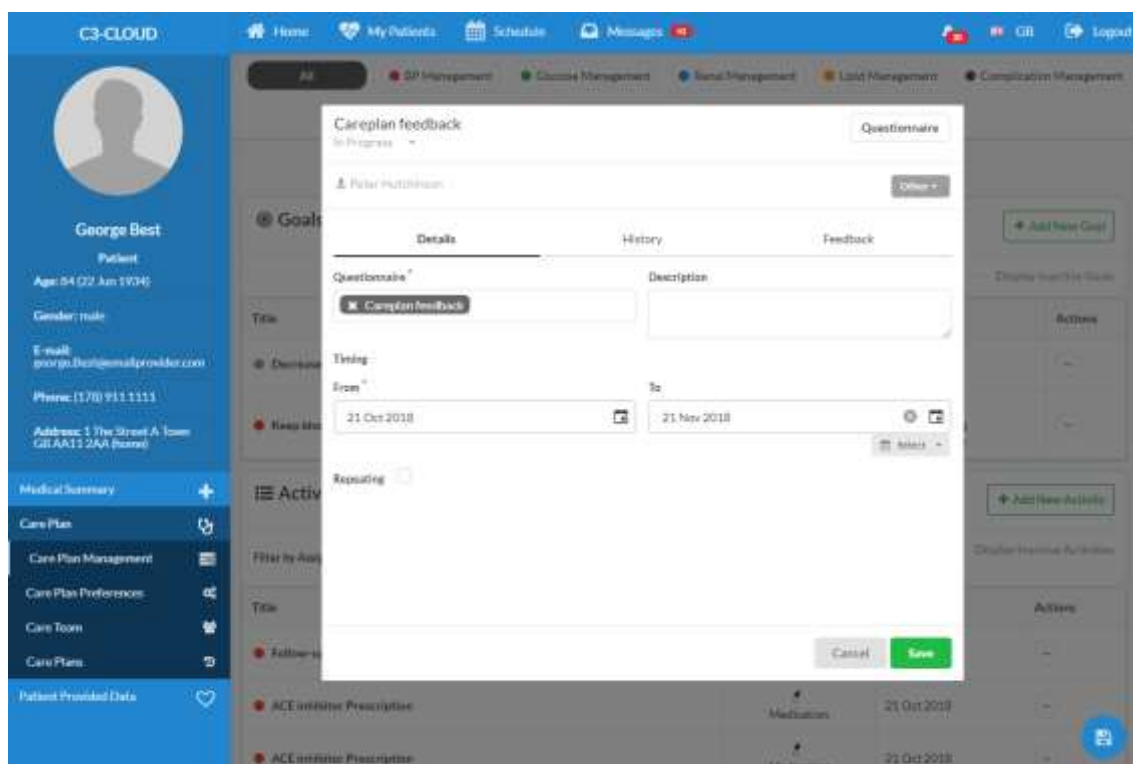


Figure 71. Questionnaire Details

If the patient has already responded to that questionnaire previously, you will see the list of responses in the “Responses” section (Figure 72).

Fill in lifestyle questionnaire

Questionnaire

In Progress

Erik Larsson

Other

your lifestyle

Timing

From

22 Jul 2009

To

29 Jul 2009

Select

Repeating ☒

Frequency

1

Period

1

week

RESPONSES

Date

24 Apr 2018 22:44

Show Response

16 May 2018 10:40

Show Response

Delete

Cancel

Save

Figure 72. Questionnaire Responses

Also, if the patient answers the questionnaire later, you will be notified (Figure 73), and you can find the response here when you review the activity.

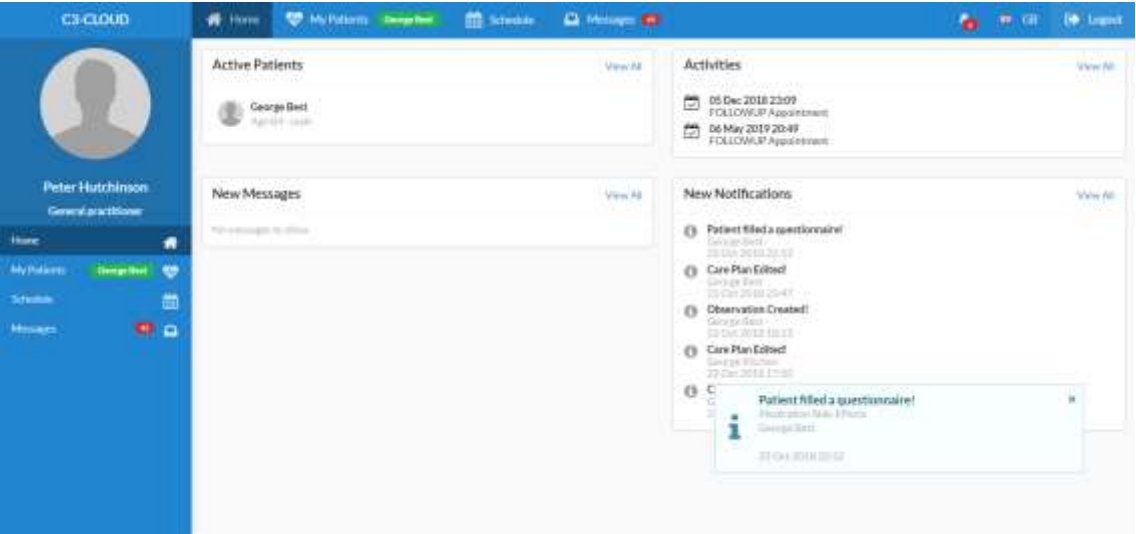


Figure 73. Questionnaire response notification

You can see the responded answers (Figure 74) by clicking “Show Response”. You are not able to change the “Questionnaire” field after it is responded by the patient. You must create a new questionnaire in this case.

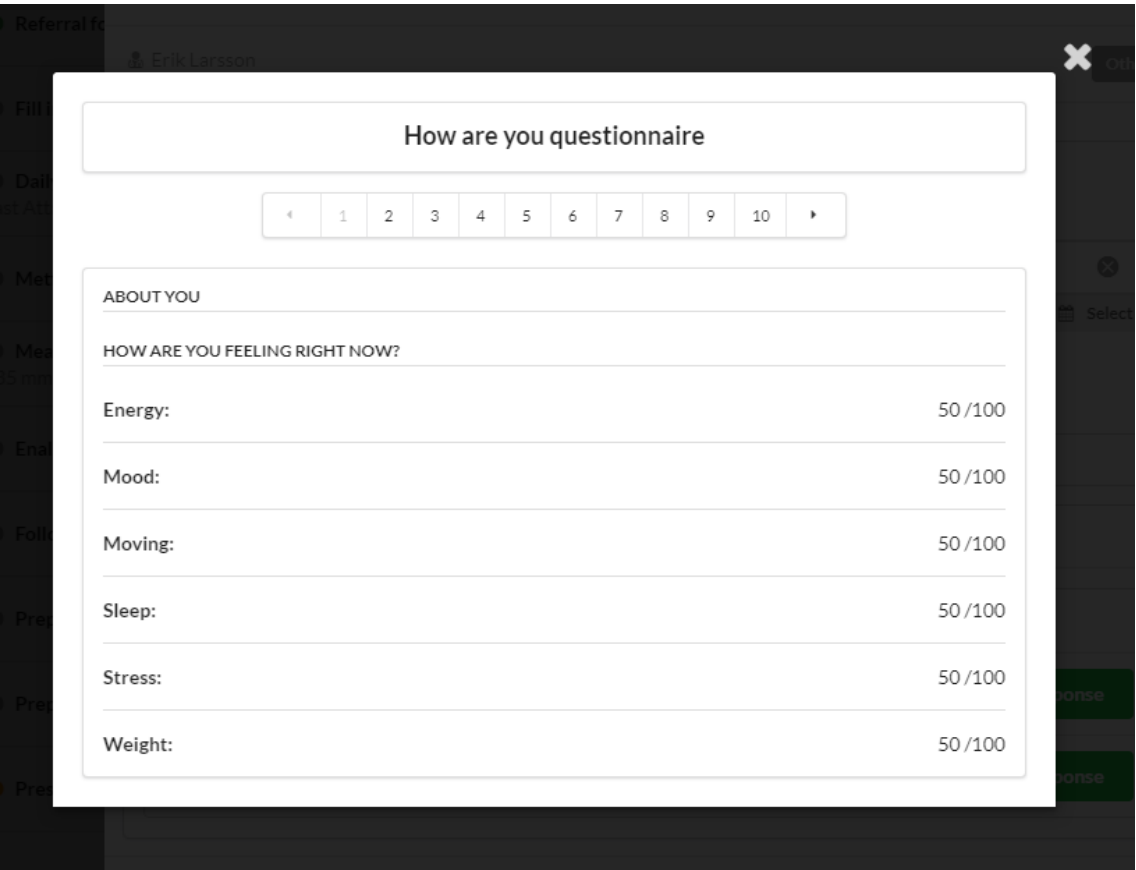


Figure 74. Questionnaire Response

- General

The last activity type is called “General”. It is the most flexible activity type that can be assigned to any performer. You can either select the predefined general activities (Figure 75) or create another activity with a free-text description only. It can also be a quantified activity like “Walk 300m each day”. Note that each activity should have at least one performer.

Figure 75. Create New Activity (General)

Also, if a predefined activity is not selected, you should set the title of the activity manually at the top of the screen.

The screenshot displays the C3-Cloud web application interface. On the left is a patient profile for George Best, a 54-year-old male, with contact and address information. The main area shows a 'Drug control' activity form. The form has four tabs: 'General', 'Details', 'History', and 'Feedback'. The 'Details' tab is selected, revealing fields for 'Activity' (set to 'Drug control'), 'Description', 'Timing' (start and end dates), 'Quantity', 'Repeating' (checked), 'Location', and 'Performer(s)' (selected as George Best). The background is dimmed, showing a list of activities and a sidebar with navigation options like 'Medical Summary', 'Care Plan', and 'Patient Provided Data'.

Figure 76. General Activity Details

- Updating an activity

To update or review an activity, click on the activity which you want to update from the 'Activities' section of the care plan page (Figure 77 below). You will see the same form as the corresponding activity form above, and the process is almost same.

C3-CLOUD

Home My Patients Schedule Messages

BP Management Glucose Management Renal Management Lipid Management Complication Management

Diets & Lifestyle Other

George Best
Patient
Age: 54 (22 Jun 1934)
Gender: male
E-mail: gbest@provider.com
Phone: (178) 911 1111
Address: 1 The Street A Town 08.AA11.3AA (Home)

Medical Summary
Care Plan
Care Plan Management
Care Plan Preferences
Care Team
Care Plans
Patient Provided Data

Activities [Add New Activity](#)

Filter by Assignee: Anyone [Display/Inactivate Activities](#)

Title	Type	Start Date	Actions
Keep blood pressure under control		21 Oct 2018	
Follow-up to check the results of the treatment	Appointment	06 Dec 2018	
ACE inhibitor Prescription	Medication	21 Oct 2018	
ACE inhibitor Prescription	Medication	21 Oct 2018	
Self-measurement of blood pressure 170 mmHg - 90 mmHg (20 Feb 2018)	Patient Order	21 Oct 2018	

Education Materials [Add New Material](#)

[Display/Inactivate Materials](#)

No education materials to show

Figure 77. Activities

Adding / updating an education material

You can add education materials to the care plan to be electronically shared with the patient by using the 'Add New Material' button (Figure 78 below). The patient will be able to see the assigned material in the patient part of the system and view the material when they wish.

Education Materials [Add New Material](#)

[Display Inactive Materials](#)

Figure 78. Add New Material Button

While adding a new education material from scratch, you can search for an existing material in the system (Figure 79) using the Material Search box. Your organisation has already identified a range of pre-validated education materials that can be used in C3-Cloud, which have been configured in the C3-Cloud system. For example, you can search by typing 'Type 2 Diabetes' and select the material for 'Type 2 Diabetes'. As in the other search fields, it is possible to search by multiple keywords to restrict the result set, e.g. a search with 'typ dia' query would return the same result.

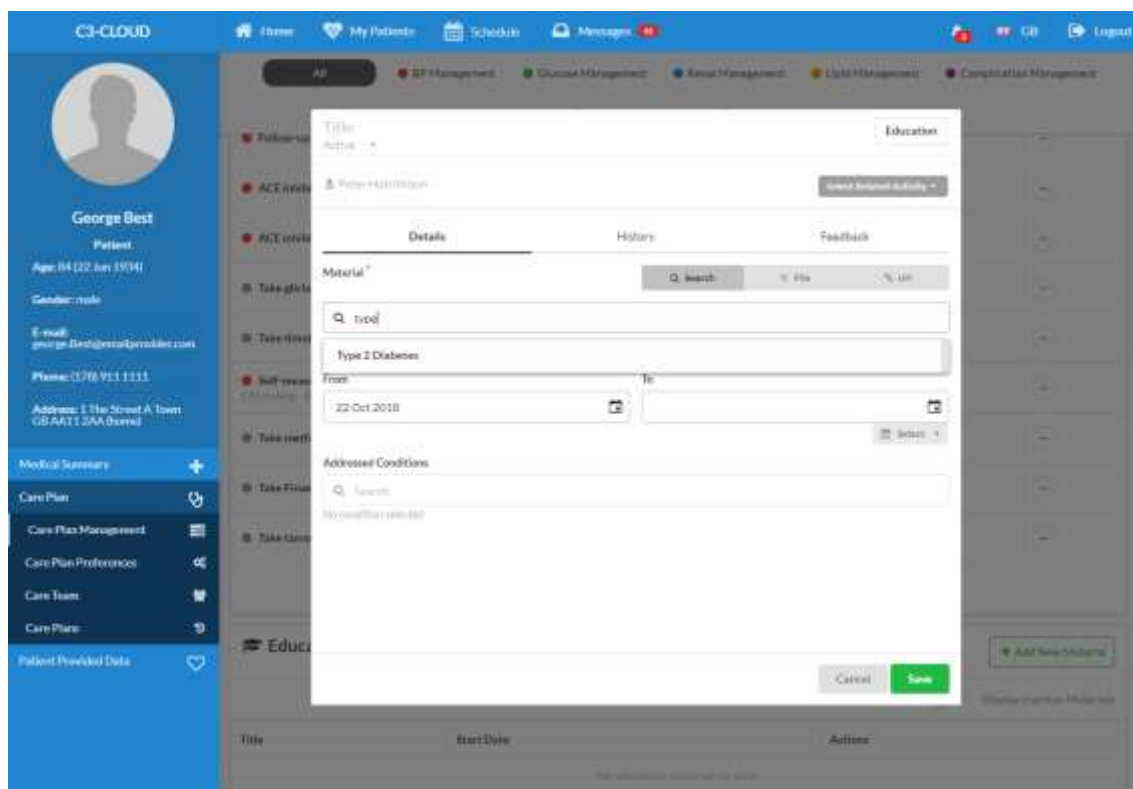


Figure 79. Create New Education Material (Searching Existing Material)

You will see its content is imported to the new education material automatically (Figure 80).

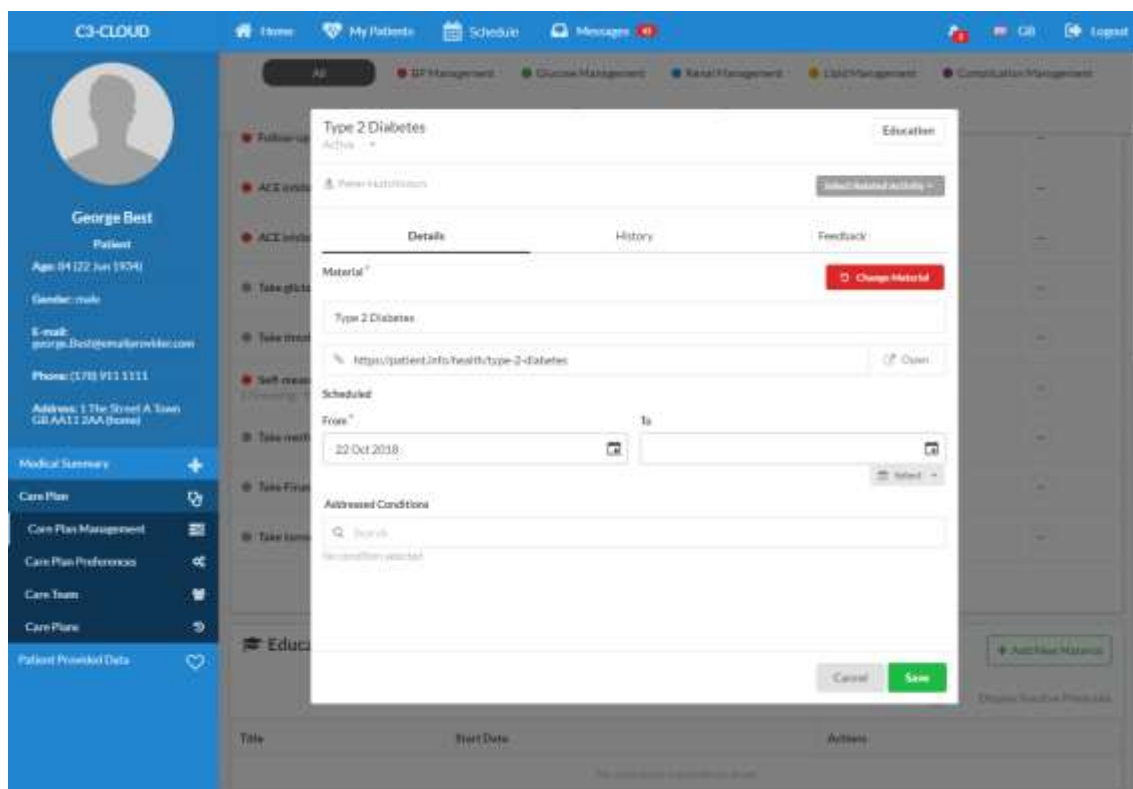


Figure 80. Creating New Education Material (Existing Material selected)

You can also add new materials to the system that you could not find in the predefined list by (i) providing a link to an online material (Figure 81) or (ii) uploading a material (e.g., a PDF file) from your computer (Figure 82).

The screenshot displays the C3-Cloud web application. On the left, a sidebar shows the patient profile for George Best, including age, gender, email, phone, and address. The main content area is titled 'Education' and contains a form for adding new education materials. The form has a 'Details' tab selected, showing fields for 'Material ID', 'Title', 'URL', 'Scheduled' (with 'From' and 'To' date pickers), and 'Addressed Conditions'. There are 'Cancel' and 'Save' buttons at the bottom right. The background shows a patient profile for George Best.

Figure 81. Creating New Education Material (Using web link)

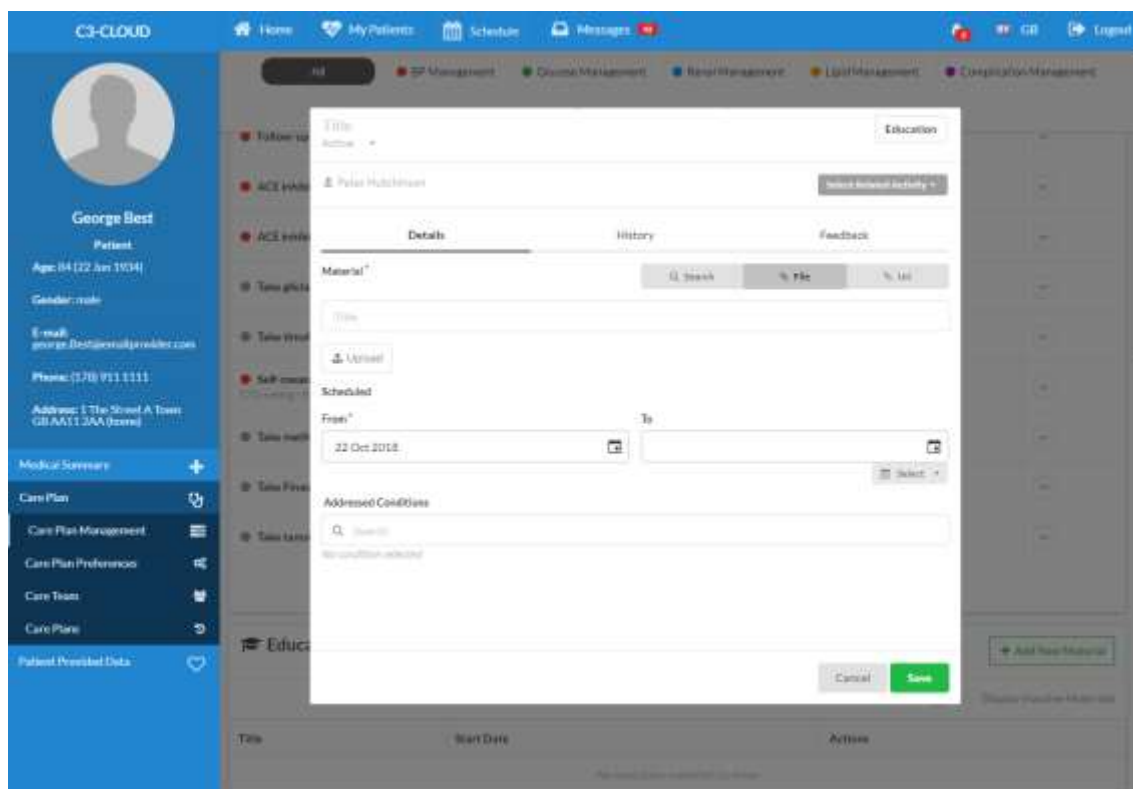


Figure 82. Creating New Education Material (by Uploading a File)

Change Tracking

When you open and view and resource, i.e. a goal, activity or education material, you will see a 'History' tab (Figure 83). This section is used to track the changes made by care team members.

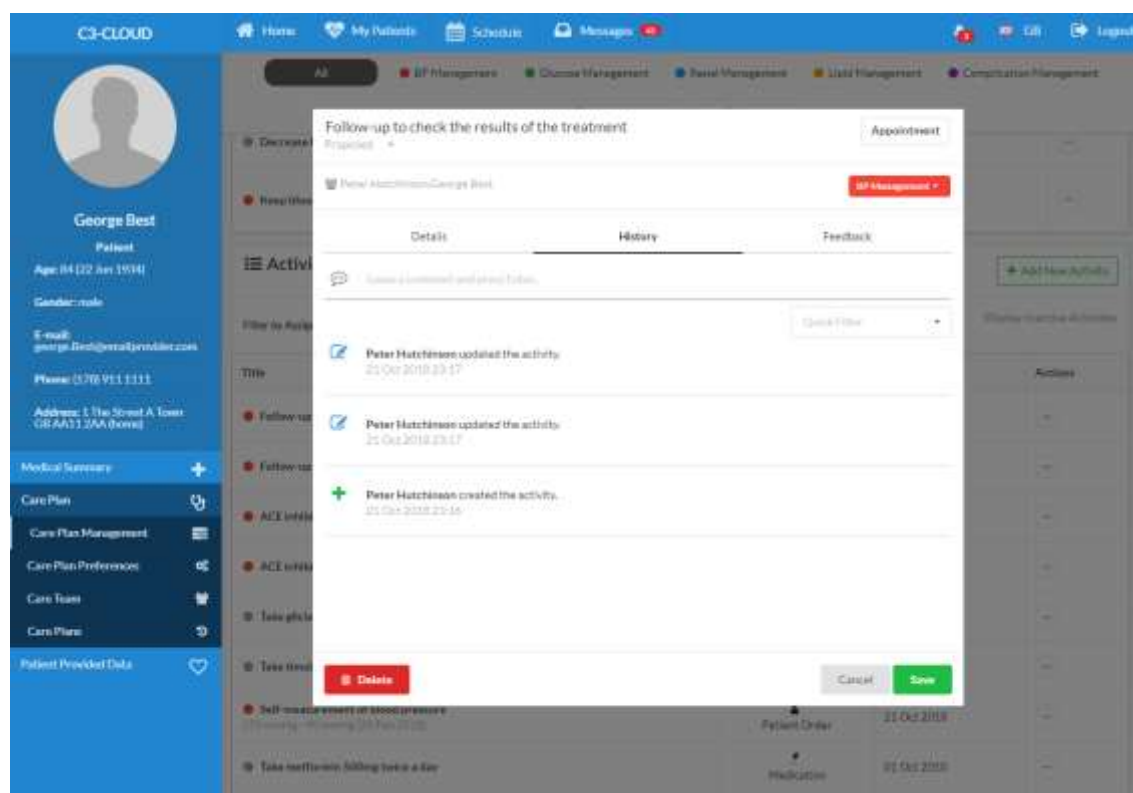


Figure 83. Change Tracking

You can also leave comments about the goal, activity or training material using the input field in the History tab and you can also see the comments of other care team members.

Patient Feedback

The “Feedback” tab can also be found in any type of resource (Figure 84). You can see the comments which are made by the patient who the care plan relates to. Patient feedback can be supported with an emoji, which can be either happy, neutral or sad, selected by the patient himself.

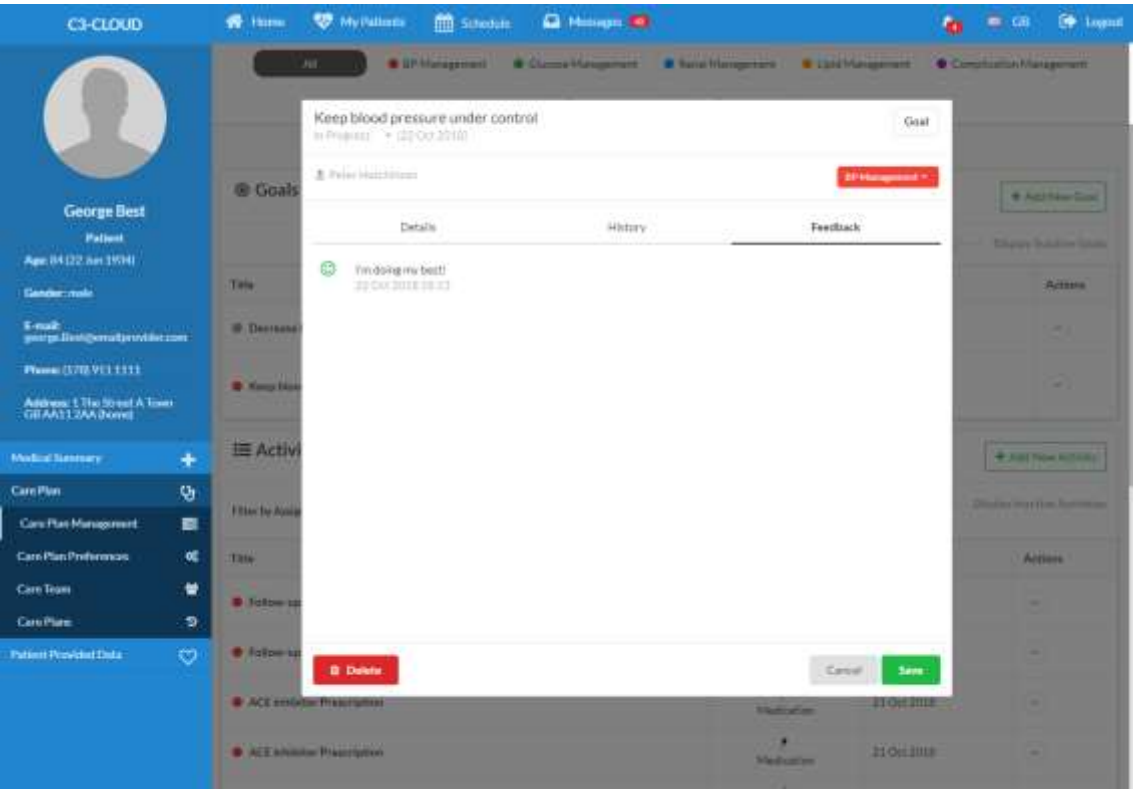


Figure 84. Patient Feedback

Quick Actions (Status Updates)

Alongside each individual “Goal”, “Activity” and “Education Material”, there is a column entitled “Actions” (see red box in Figure 85 below).

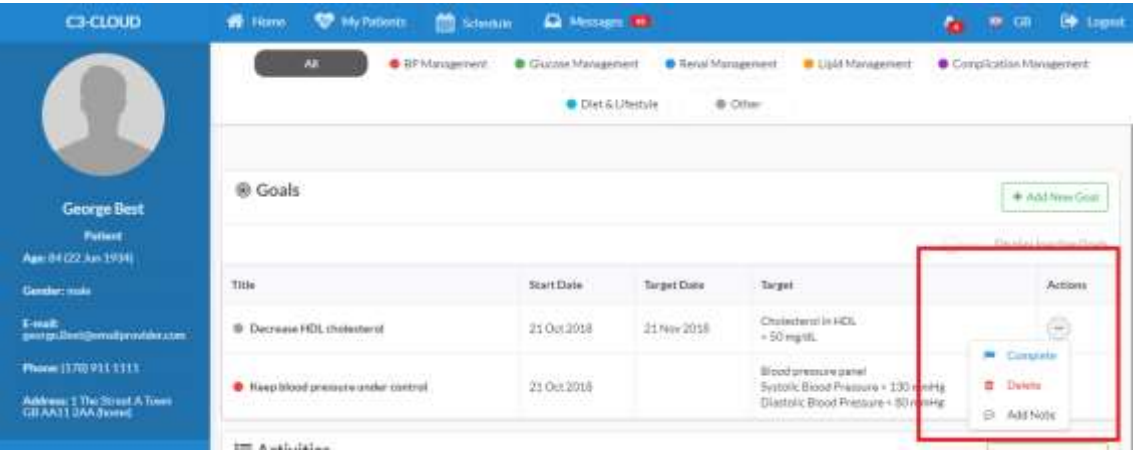


Figure 85. Quick Actions

When you click on the ‘...’ button in that column for any resource, you will see 3 options, i.e. “Complete” or “Delete” this resource, or “Add Note”. These buttons can be used to quickly and easily update the status of a goal, activity or education material, and add notes for other care team members.

Monitoring Patient Observations

Some activities that are assigned to the patients may have observations associated with them, e.g. meal photos, lab results or vital sign measurements. When the patient provides observations via the Patient

Empowerment Platform (e.g. blood glucose measurement) or observations are provided by a clinical system (e.g., HbA1c result), these results are automatically matched, and the latest record is shown below the corresponding activity title (Figure 86).

Title	Type	Start Date	Actions
● Fill in lifestyle questionnaire	Questionnaire (Repeating)	22 Jul 2009	⋮
● Daily meal photo Last Attachment on: (23-Apr-2018)	Patient Order (Repeating)	22 Jul 2009	⋮
● Metformin twice a day	Medication	21 Jul 2009	⋮
● Measure blood pressure weekly 535 mmHg - 85 mmHg (17 Sep 2018)	Patient Order (Repeating)	21 Jul 2009	⋮

Figure 86. Activities with Latest Observations

You can see all these observations in the activity details by clicking on the activity title. For example, click on “Blood Pressure Observation” activity to see the latest BP observations provided by the patient in a chart view as shown in Figure 87.

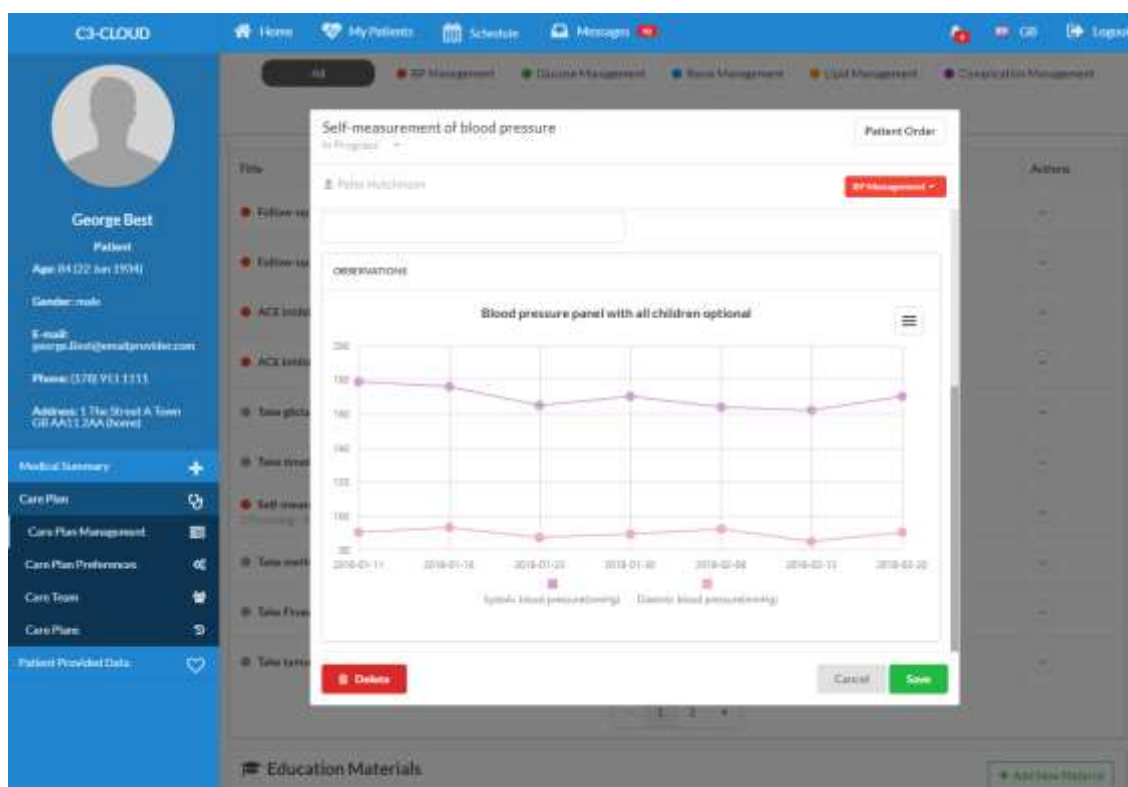


Figure 87. Activity with Blood Pressure Measurements

If the related observations of the activity are photos, they will be shown as a gallery and the user will be able to enlarge the photo by clicking on it and then swiping between photos. When you click on the

“Daily Photo Upload” activity, you will see the meal photos uploaded by the patient under the “Attached Photos” section (Figure 88).

The screenshot shows a web form titled "Daily meal photo" with a status of "In Progress". In the top right corner is a "Patient Order" button. Below the title, the patient's name "Peter Hutchinson" is displayed next to a person icon, with an "Other" dropdown button to the right. The "Timing" section includes "From" and "To" date pickers set to "22 Jul 2009" and "29 Jul 2009" respectively, with a "Select" button. Below this is a "Repeating" checkbox that is checked. The "Frequency" is set to "3" and the "Period" is set to "1" day. The "Location" is set to "Patient's Home". The "ATTACHED PHOTOS" section displays three small images of food. At the bottom of the form are three buttons: a red "Delete" button, a grey "Cancel" button, and a green "Save" button.

Figure 88. Meal photos

When there is a response by the patient for a questionnaire activity, you can see the answers from the activity details. For example, when you click the “Medication Side-Effects” questionnaire activity and then click the “Show Response” link (Figure 89), you can see the filled in questionnaire by the patient (Figure 90).

Medication Side Effects Observation

In Progress ▾

Peter Hutchinson Other ▾

Timing

From To Select ▾

Repeating ☒

Frequency Period ▾

RESPONSES

Date	Action
24 Apr 2018 22:44	Show Response
16 May 2018 10:40	Show Response

[Delete](#) [Cancel](#) [Save](#)

Figure 89. Questionnaire Response-Part1

Medication Side-Effects

Do you experience side effects on your medications?: x

Which side effects have you experienced?: 0

HOW SEVERE ARE THE SIDE-EFFECTS YOU HAVE EXPERIENCED?

☐ Mild
☐ Medium
☐ Severe

Figure 90. Questionnaire Response- Part 2

Publishing Care Plan Changes

If the care plan is newly created (i.e. in draft status), there will be a “Activate & Publish” button with a “save” icon in the right bottom corner of the screen (Figure 91). After you have finished creating the care plan for the first time, you will need to click this button to activate the care plan. The care plan will not be active until you click this button. Then, the care plan will be activated, and the other care team members will be notified via the C3-Cloud system (no separate emails will be sent). You can leave the care plan without activating it and then come back later and continue with adding/updating the goals and activities. Until you activate the care plan, you will be reminded that the care plan is not activated whenever you leave the care plan screen.

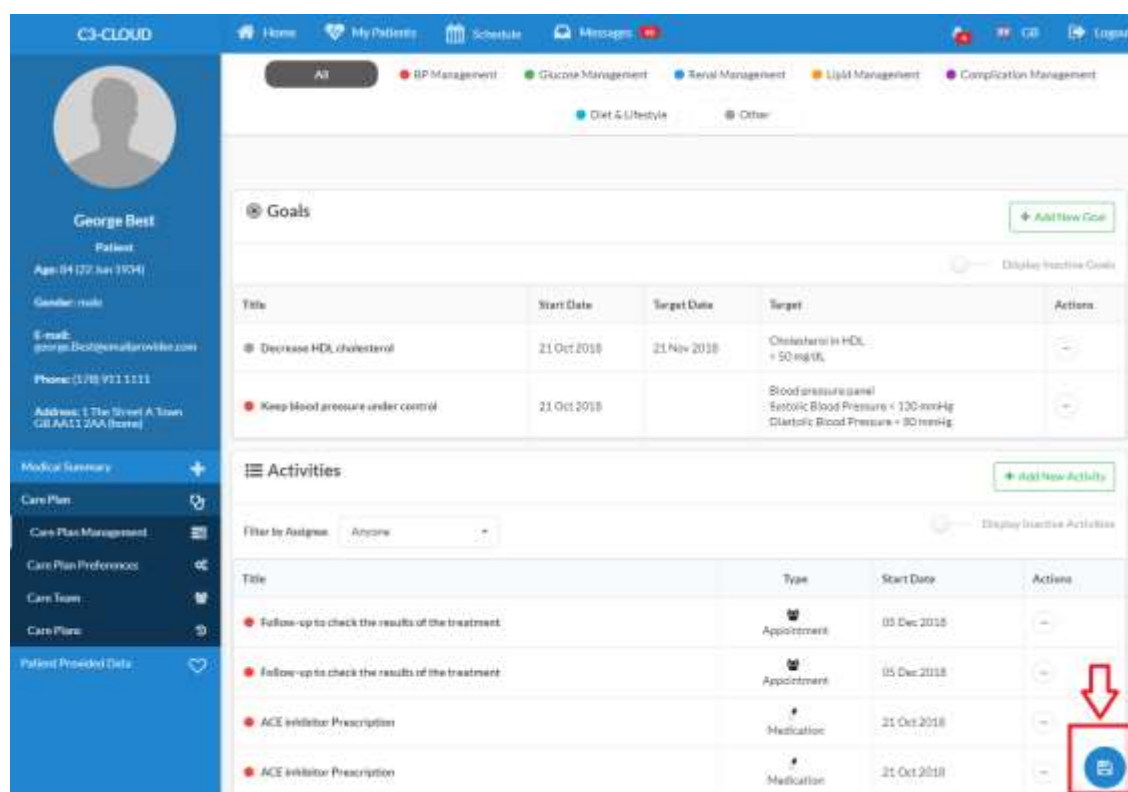


Figure 91. Activate & Publish Button

After the activation, when you do a change on the care plan, a “Publish” button will appear instead of the “Activate & Publish” button (Figure 92). This button is for notifying other care team members and the patient about the care plan update. Even if you don’t press this button, other members and the patient will be automatically informed when you leave the care plan management screen after doing some updates.

The screenshot displays the C3-Cloud user interface. On the left is a sidebar with a patient profile for George Best (Age: 64, 122 lbs, 1954) and a menu with options like Medical Summary, Care Plan, and Patient Provided Data. The main area shows two sections: 'Goals' and 'Activities'. The 'Goals' section has a table with two entries: 'Decrease HDL cholesterol' and 'Keep blood pressure under control'. The 'Activities' section has a table with four entries, including follow-up appointments and ACE inhibitor prescriptions. A red arrow points to a blue circular icon with a white refresh symbol in the bottom right corner of the 'Activities' table.

Title	Start Date	Target Date	Target	Actions
Decrease HDL cholesterol	21 Oct 2018	21 Nov 2018	Cholesterol in HDL > 50 mg/dL	[-]
Keep blood pressure under control	21 Oct 2018		Blood pressure panel Systolic Blood Pressure < 130 mmHg Diastolic Blood Pressure < 80 mmHg	[-]

Title	Type	Start Date	Actions
Follow-up to check the results of the treatment	Appointment	05 Dec 2018	[-]
Follow-up to check the results of the treatment	Appointment	05 Dec 2018	[-]
ACE inhibitor Prescription	Medication	21 Oct 2018	[-]
ACE inhibitor Prescription	Medication	21 Oct 2018	[-]

Figure 92. Publish

Care Plan Preferences

Another important care plan module is the “Care Plan Preferences” screen (Figure 93).

The screenshot displays the C3-Cloud user interface. On the left is a sidebar for patient 'George Best', showing details like age (64), gender (male), and contact information. The main area is titled 'Care Plan Preferences' and contains two primary sections: 'Goals' and 'Activities'. The 'Goals' section currently shows 'No goals to show'. The 'Activities' section is filtered by 'Assigned' and lists four medication tasks:

Title	Type	Start Date	Actions
Take gliclazide 80mg once a day	Medication	01 May 2015	[Edit] [Delete]
Take metformin 500mg twice a day	Medication	01 Oct 2010	[Edit] [Delete]
Take Finasteride 5mg once a day	Medication	04 Aug 2010	[Edit] [Delete]
Take tamsulosin 0.4mg per day	Medication	03 Feb 2008	[Edit] [Delete]

Figure 93. Care Plan Preferences

Using this module, you can set/change the main diseases that are addressed in the care plan, set the “Next Review Date”, track the changes made on the care plan, export the care plan as a PDF document and “Close” the care plan.

If you change the “Addressed Conditions” of the care plan and click “Save & Apply” (Figure 94), the high-level goals and the associated CDS services will be reorganized according to newly selected diseases.



Figure 94. Care Plan Preferences Page

If you want to “Close” the care plan, click on the “Close Care Plan” button and confirm that you want to close the care plan (Figure 95).

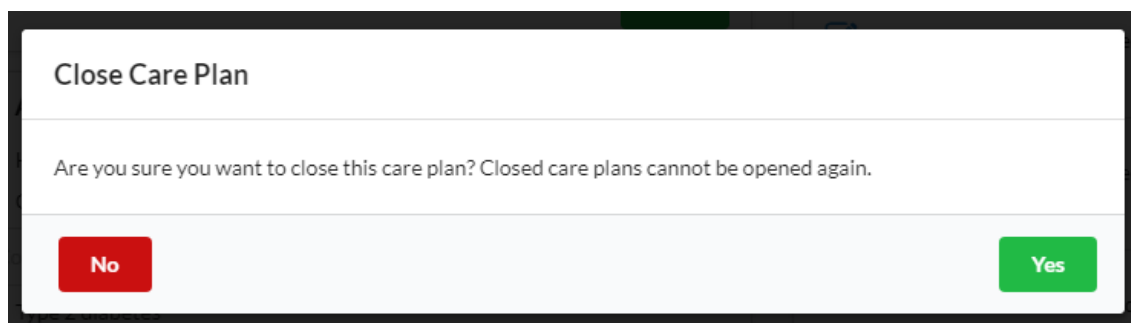
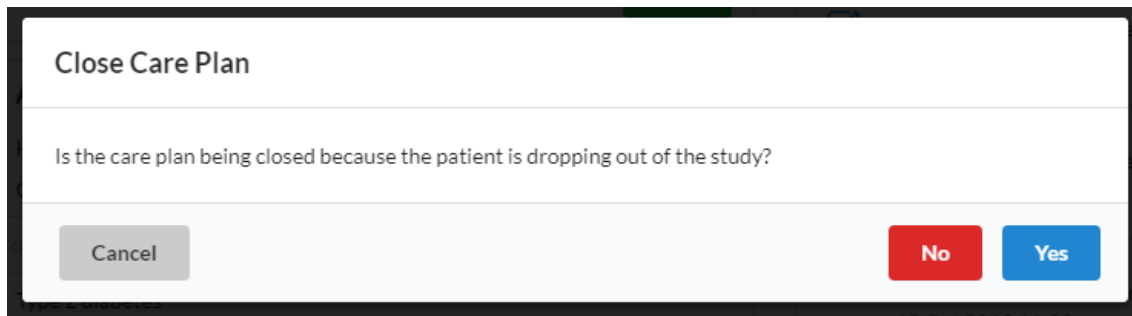


Figure 95. Close Care Plan (Confirmation)

You will then be asked if you wish to close the care plan because the patient has dropped out of the study or not (Figure 96).



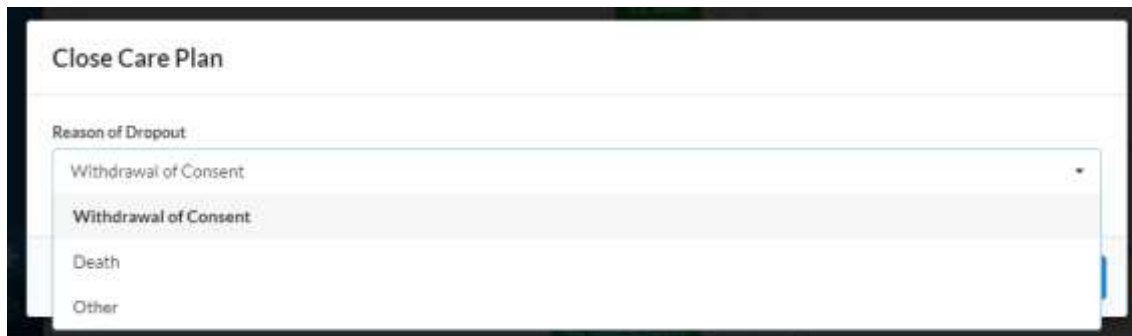
Close Care Plan

Is the care plan being closed because the patient is dropping out of the study?

Cancel No Yes

Figure 96. Close Care Plan (Drop-out option)

If you click “Yes”, you will be asked to enter the reason for the patient dropping out (Figure 97). Click “Cancel” if you have chosen not to close the care plan.



Close Care Plan

Reason of Dropout

- Withdrawal of Consent
- Withdrawal of Consent
- Death
- Other

Figure 97. Close Care Plan (Reason of Drop-out)

Listing Patient’s Care Plans

If the patient has any inactive (i.e. closed) care plans, you can list them by navigating via the “Care Plans” link from the left sidebar (Figure 98) to open the “Care Plans” window (Figure 99) and open them by clicking on any of the care plans. In C3-Cloud, a patient can have only one active care plan at a time, as the project’s focus is on integrated care plans, not disease specific treatment plans.

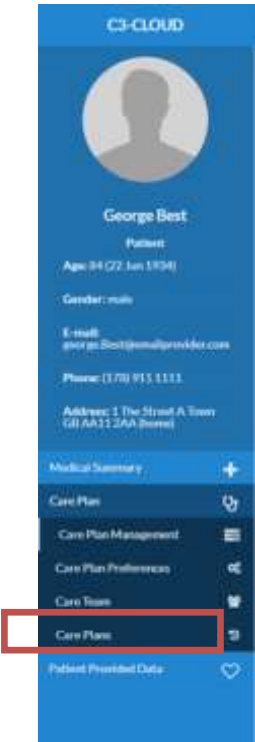


Figure 98. Care Plans – Part 1

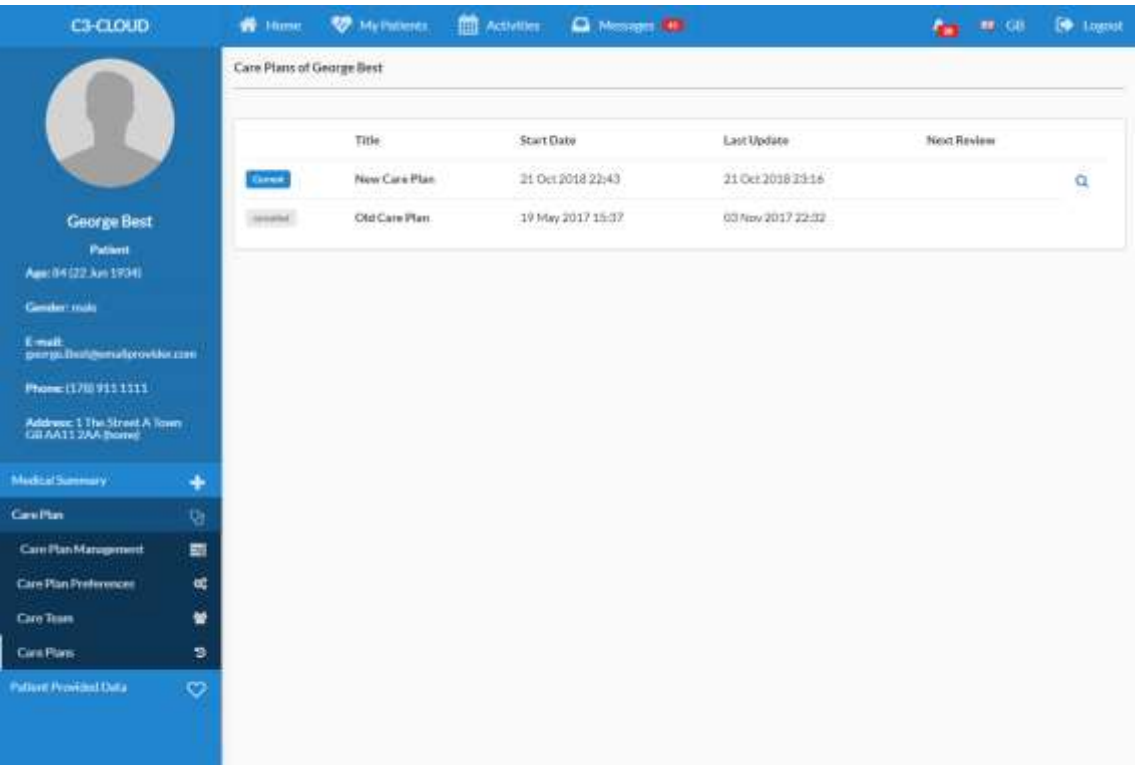


Figure 99. Care Plans -Part 2

Care Team Management

Showing the Care Team

You can see the assigned care team for a care plan by clicking the “Care Team” button below the “Care Plan” in the left sidebar (Figure 100Error! Reference source not found.).

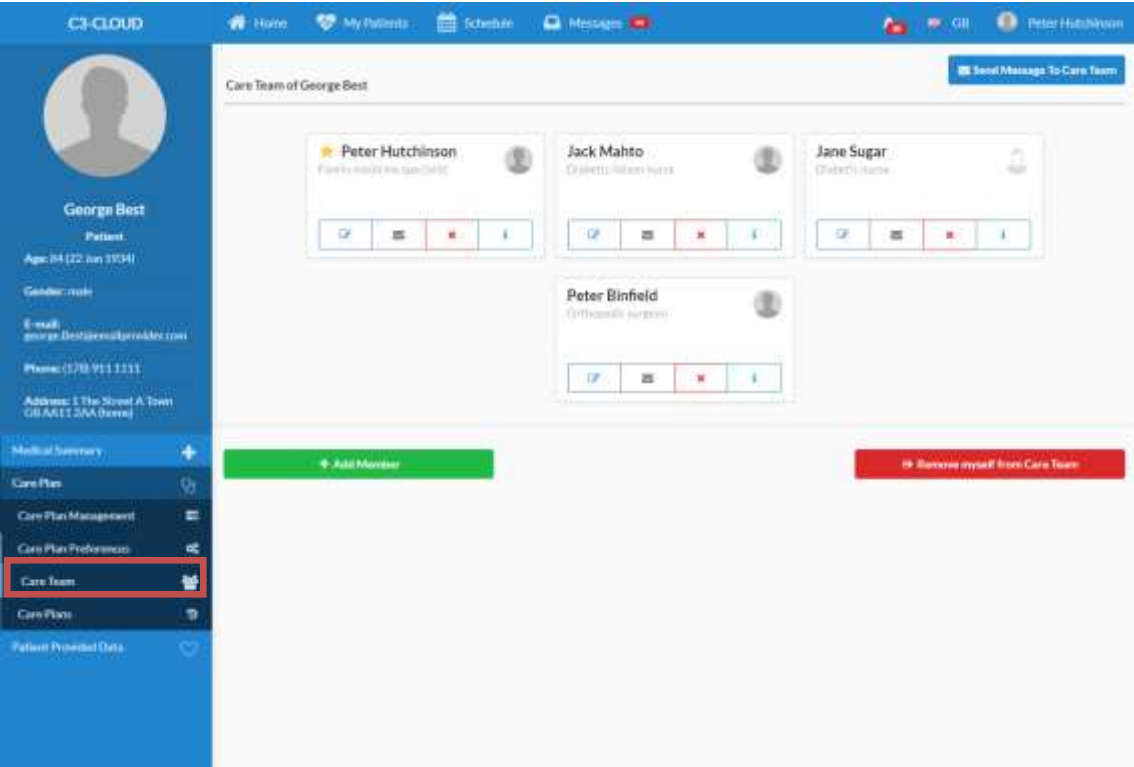


Figure 100. Care Team of the Patient

As a care team member, you can see information of other team members by clicking on Info icon (Figure 101) or contact them by clicking on Envelope icon (Figure 102, Figure 103) using this module.

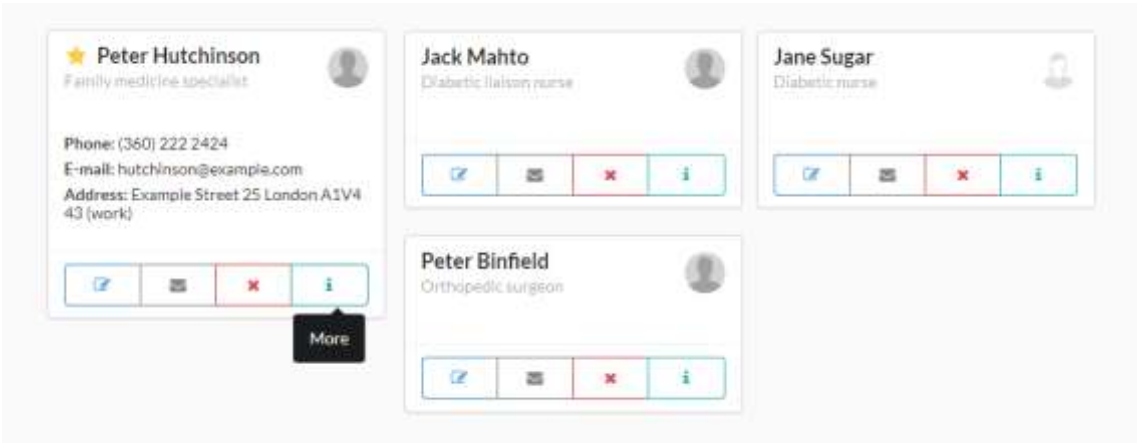


Figure 101. Viewing the details of other care team members

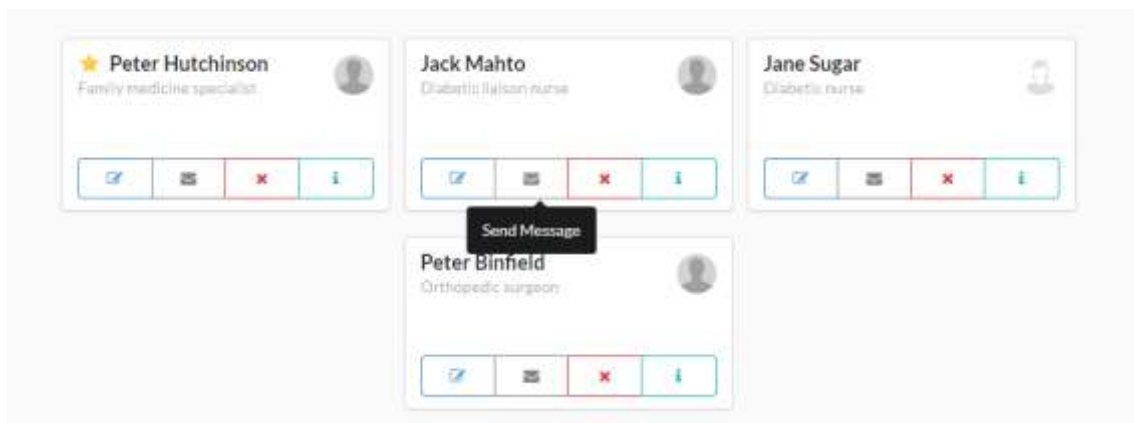


Figure 102. Sending direct messages to other care team members

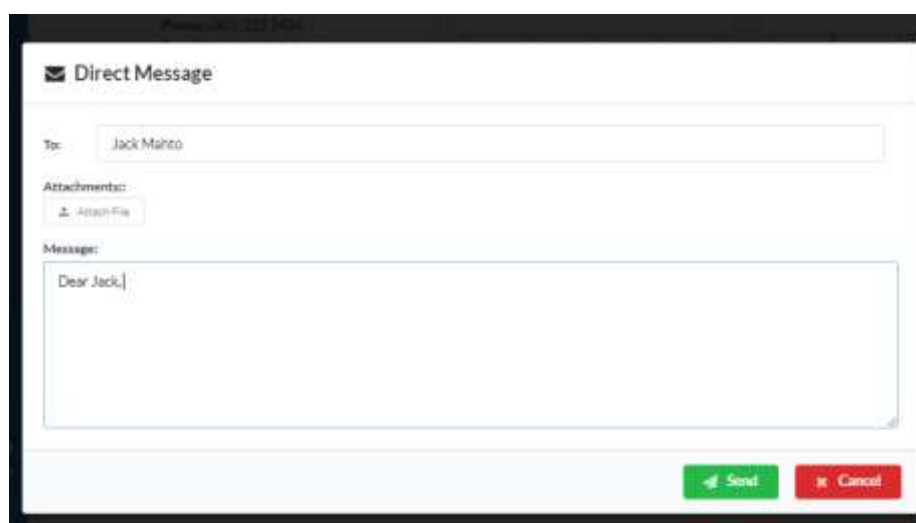


Figure 103. Sending Message to a Care Team Member

Updating Care Team Members

As the Care Team Manager, you can add, remove or edit the members of a care team. A care team can have only one manager and ideally this should be the GP of the patient. However, non-managers can also invite other members to the care team. Click on the Pen icon, to edit the details of a care team member (Figure 104).

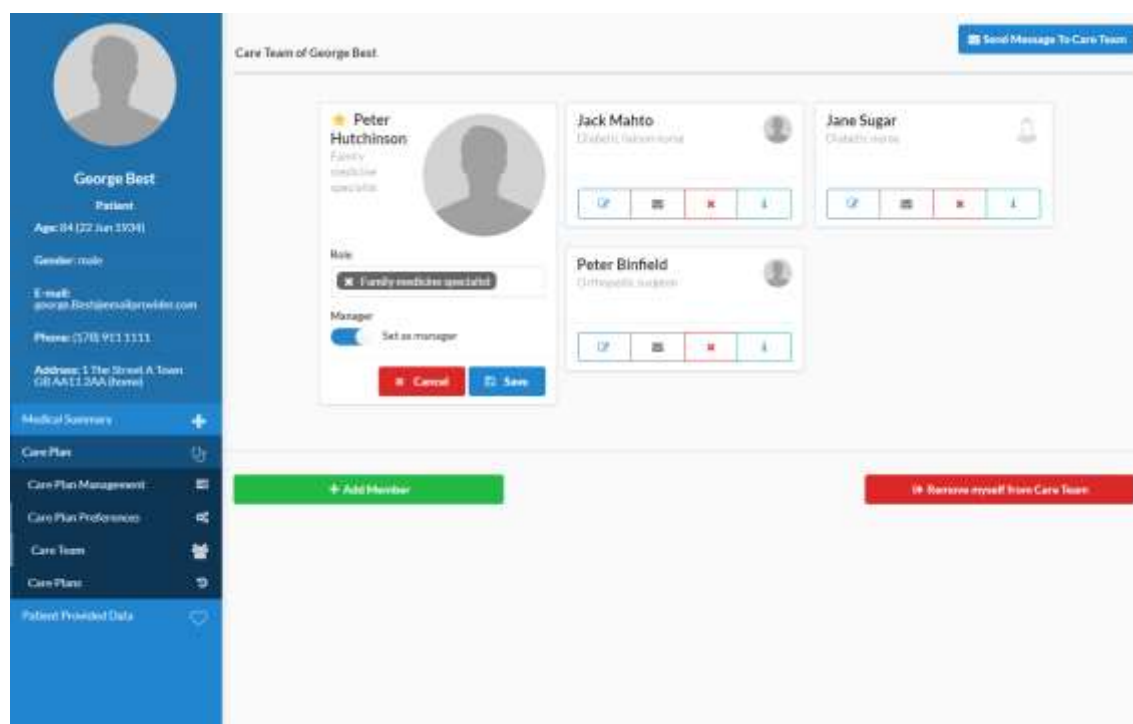


Figure 104. Editing a Member

To add a new member, press “Add Member” button and select a user via search bar (Figure 105). Please note that only professionals who are registered in the C3-Cloud system can be selected.

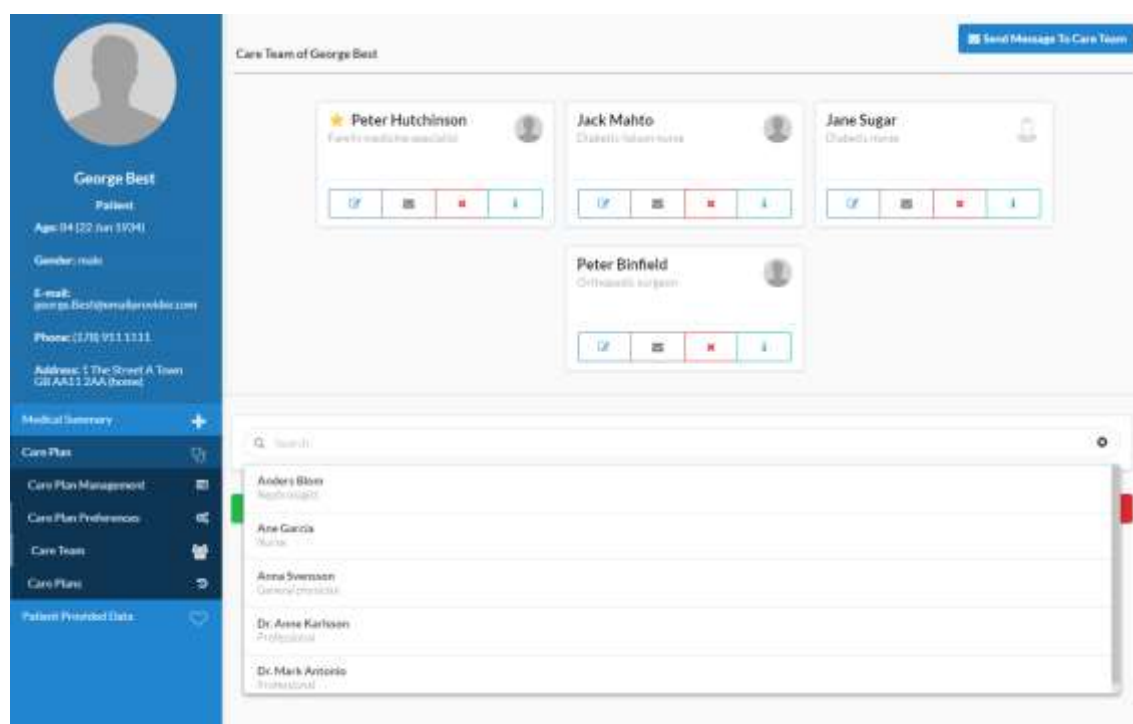


Figure 105. Selecting a User to Add to the Care Team

An invitation message is sent to the new member so that they can approve their participation in the care team (Figure 106). An example invitation message is shown in Figure 107.

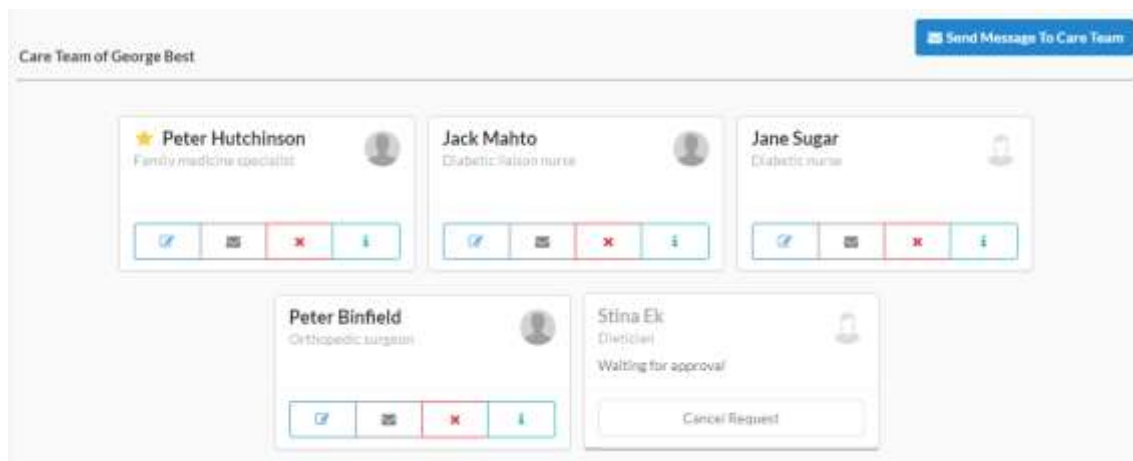


Figure 106. Waiting the New Member to Approve Participation



Figure 107. Invitation Message for Care Team Participation

After the new member agrees to participate by clicking on the “Approve” button, they will be added to the care team. From now on, they can navigate to the “My Patients” view from the top menu, see the patient in their patient list, review their medical summary and update their care plan.

Activity Schedule

You can see your scheduled activities like appointments, referral requests, etc. on a calendar in the ‘Schedule’ screen. An example “Treatment Follow-up Appointment” is displayed in Figure 108 below. It is possible to click on it to see the details of the scheduled activity. You can also edit these activities or add new ones using this module.

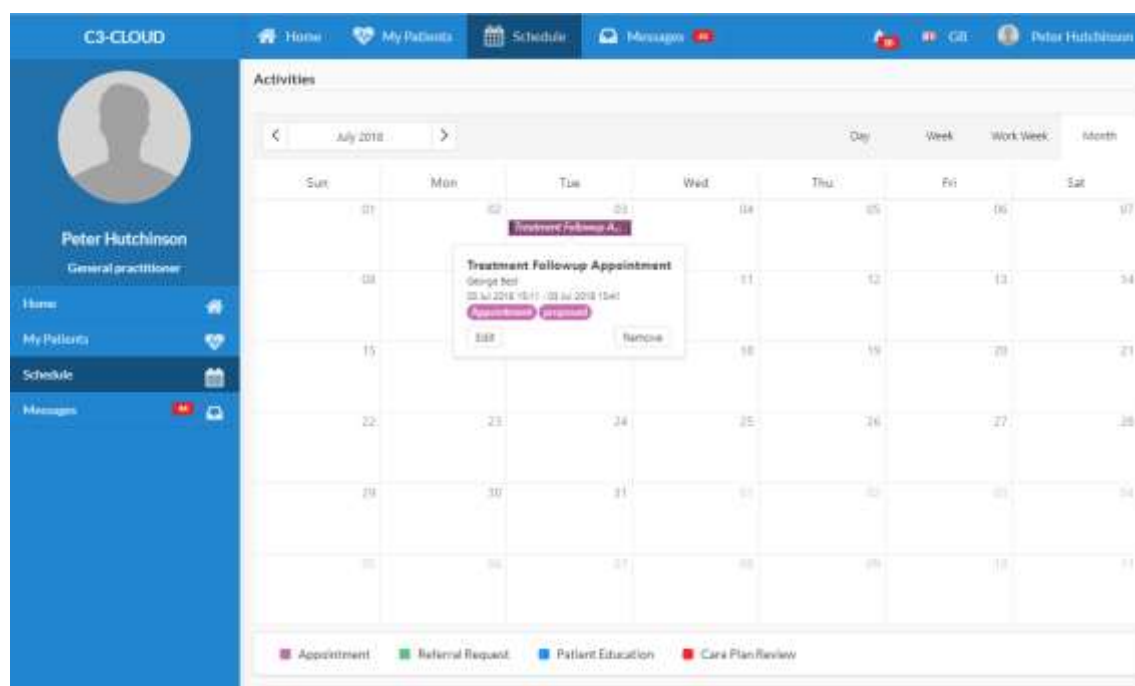


Figure 108. Scheduled Activities

Messaging

You can communicate with other health professionals or patients using the messaging module. You can send messages to patients, care team members or other practitioners to exchange information. Click on the 'Messages' link from the top menu to open the messaging module. The 'Messages' menu item always displays the number of unread messages within a red badge (Figure 109).

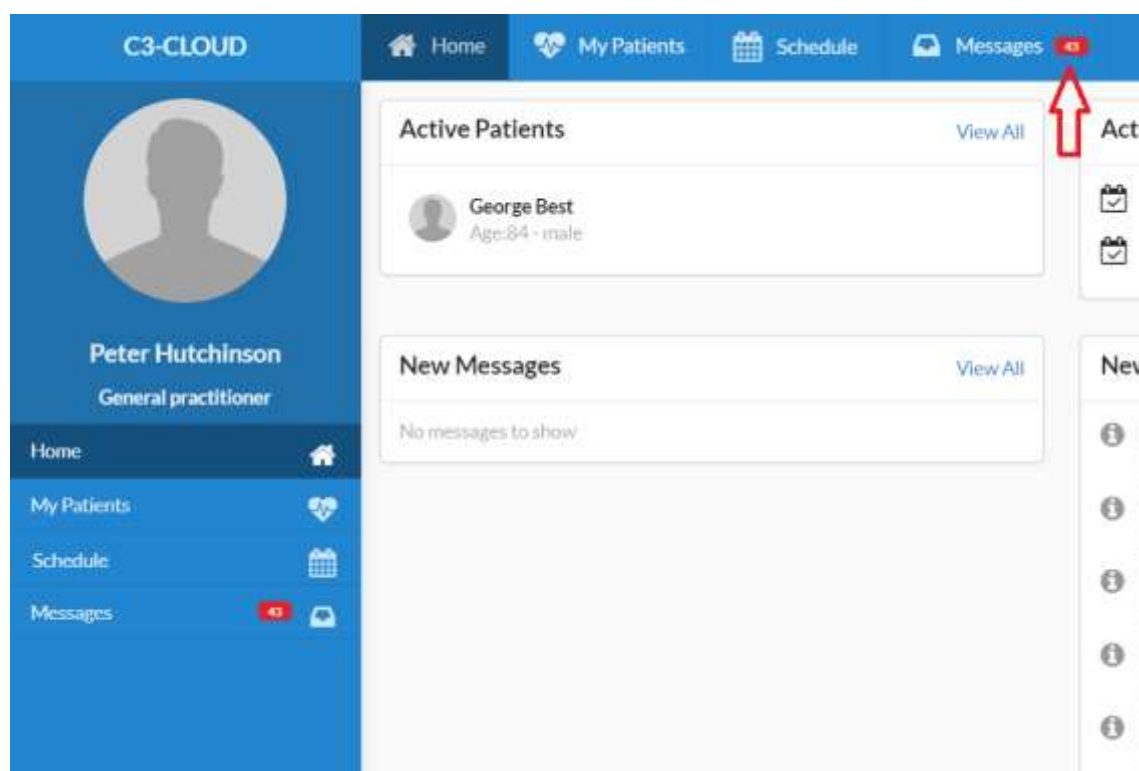


Figure 109. Messages

Inbox

You can see the messages sent to you from the Inbox section (Figure 110). The messages can be grouped by the participant of communication as care team members or patients using the tabs below the menu. You can also use “Filter Messages” button to search messages by a text that message body contains or search a user to see only messages related to him/her (Figure 111).

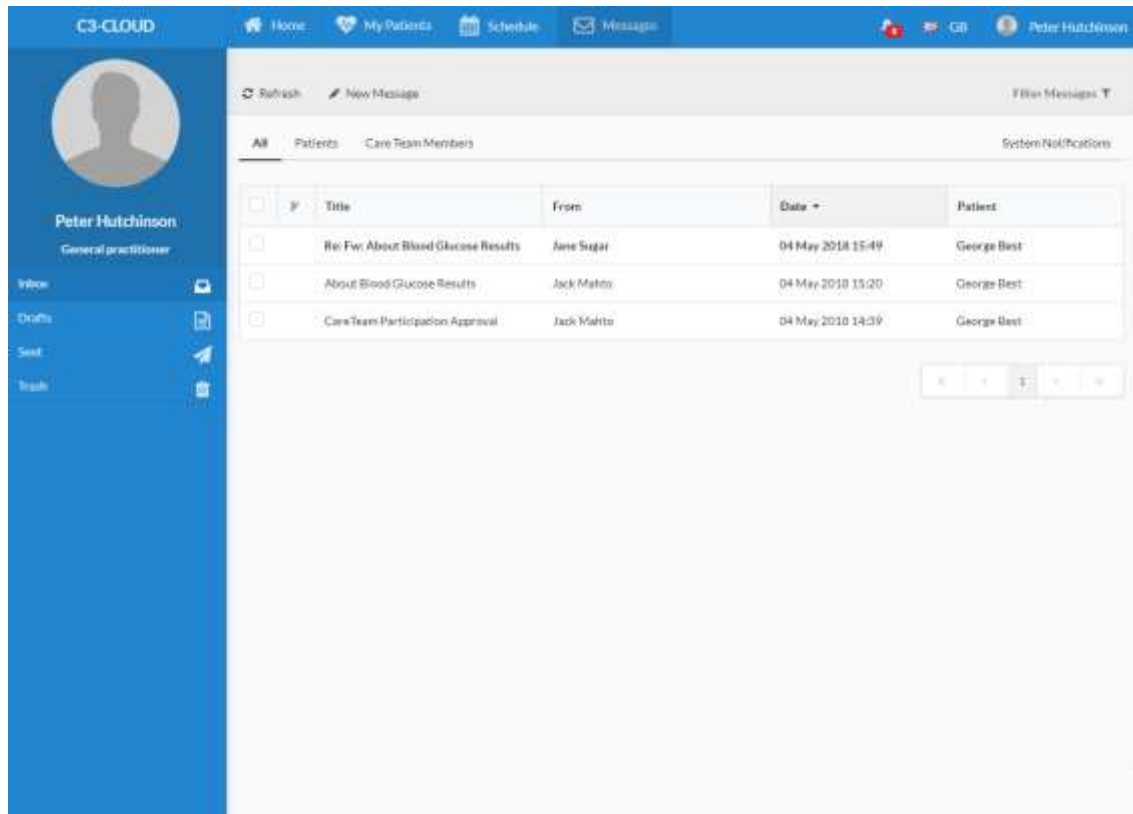


Figure 110. Inbox

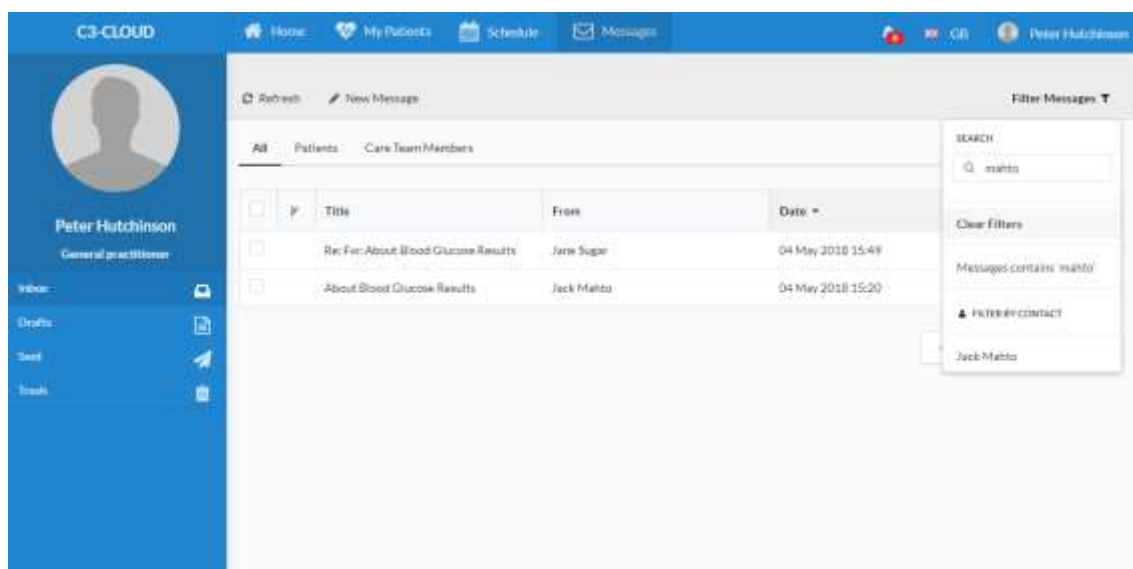


Figure 111. Filtering Messages

Sending a Message

You can send a message to one or more users. The related patient of the message can be indicated to make tracking easier. Also, it is possible to include attachments in messages to e.g. share images, lab results or any other useful data between users, using the ‘Attach File’ function.

The screenshot shows the 'C3-CLOUD' interface for sending a new message. The top navigation bar includes 'Home', 'My Patients', 'Schedule', and 'Messages'. The user profile on the left identifies 'Peter Hutchinson' as a 'General practitioner'. The message form on the right has fields for 'From' (Peter Hutchinson), 'To' (empty), 'Title' (empty), and 'Patient' (empty). Below these fields is an 'Attach File' button and a large text area for the message body. At the bottom right of the form are three buttons: 'Send' (green), 'Save' (blue), and 'Cancel' (red).

Figure 112. Sending New Message

There are also “Reply” and “Forward” features as with other common mail services.

This screenshot shows the 'C3-Cloud' interface for forwarding a message. The form is pre-filled with the following information: 'From' (Peter Hutchinson), 'To' (Jane Sugar), 'Title' (Fw: About Blood Glucose Results), and 'Patient' (George Best). The 'Attach File' button is visible. The message body contains a forwarded email from Jack Mahto to Jane Sugar, dated 04 May 2018, with the subject 'About Blood Glucose Results'. The 'Send', 'Save', and 'Cancel' buttons are at the bottom right.

Figure 113. Forwarding a Message

You can see a conversation with replies as a thread (Figure 114).

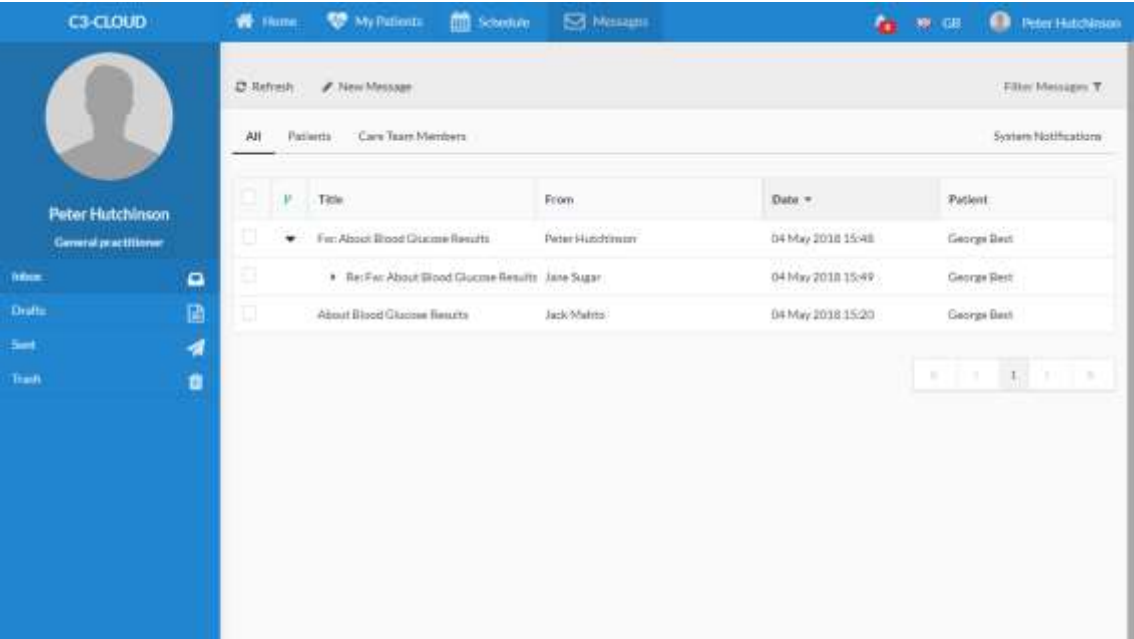


Figure 114. Inbox as Thread

Saving a Message

You may want to write a message now but send it at a later point in time. Written messages can be saved as drafts and edited any time. These messages can be found in “Drafts” section.

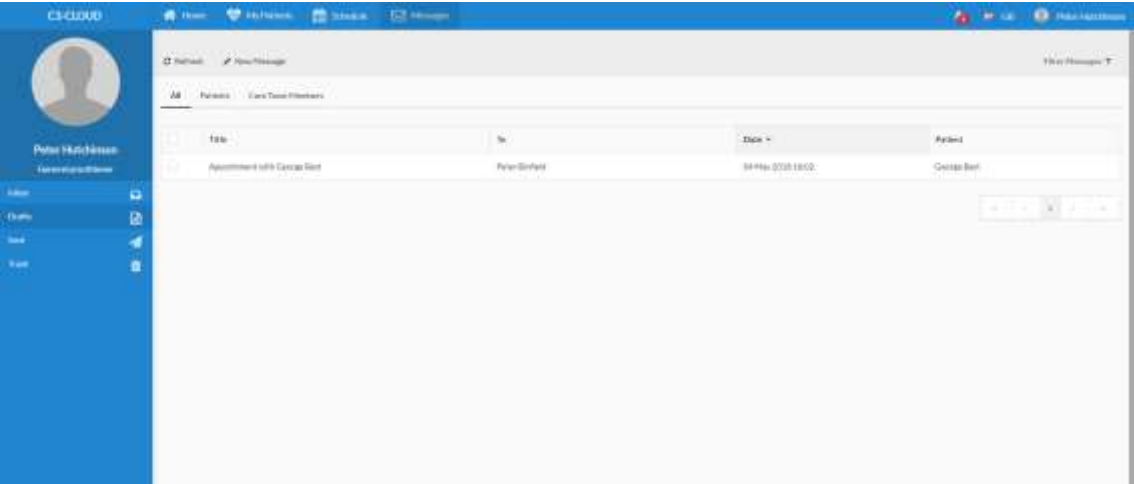


Figure 115. Drafts

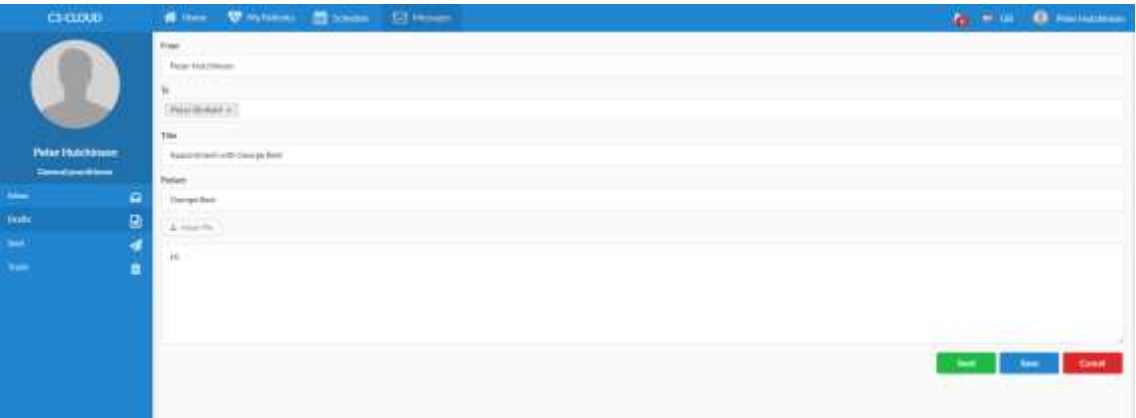


Figure 116. Editing a Saved Message

Deleting a Message

You can delete a message by selecting it and clicking the “Remove” button which will appear on top when a message is selected (Figure 117). Deleted messages are stored in the “Trash” section (Figure 118). These messages can be recovered and used later.

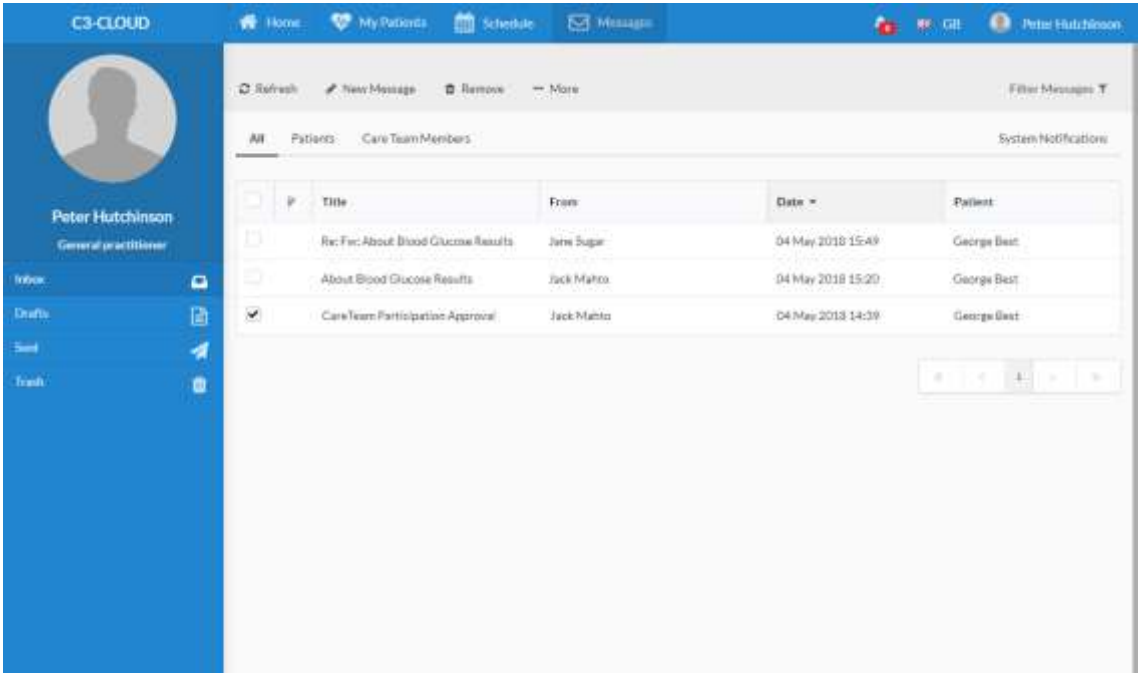


Figure 117. Removing a message

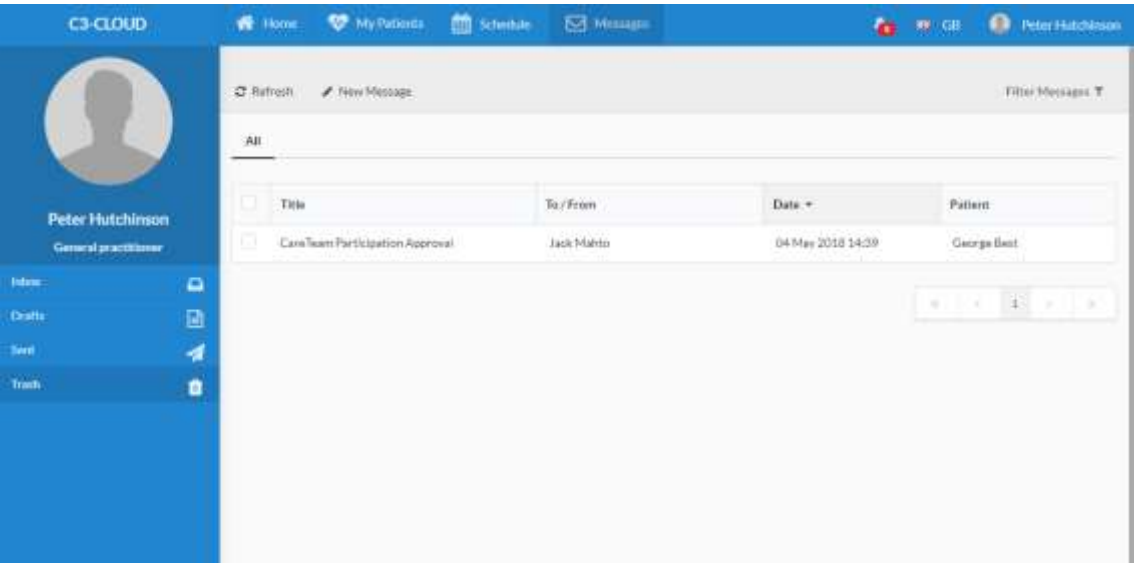


Figure 118. Trash

Notifications

You can see the recent unread notifications via the default notification menu, which can always be reached via the Bell icon at the top right (Figure 119).

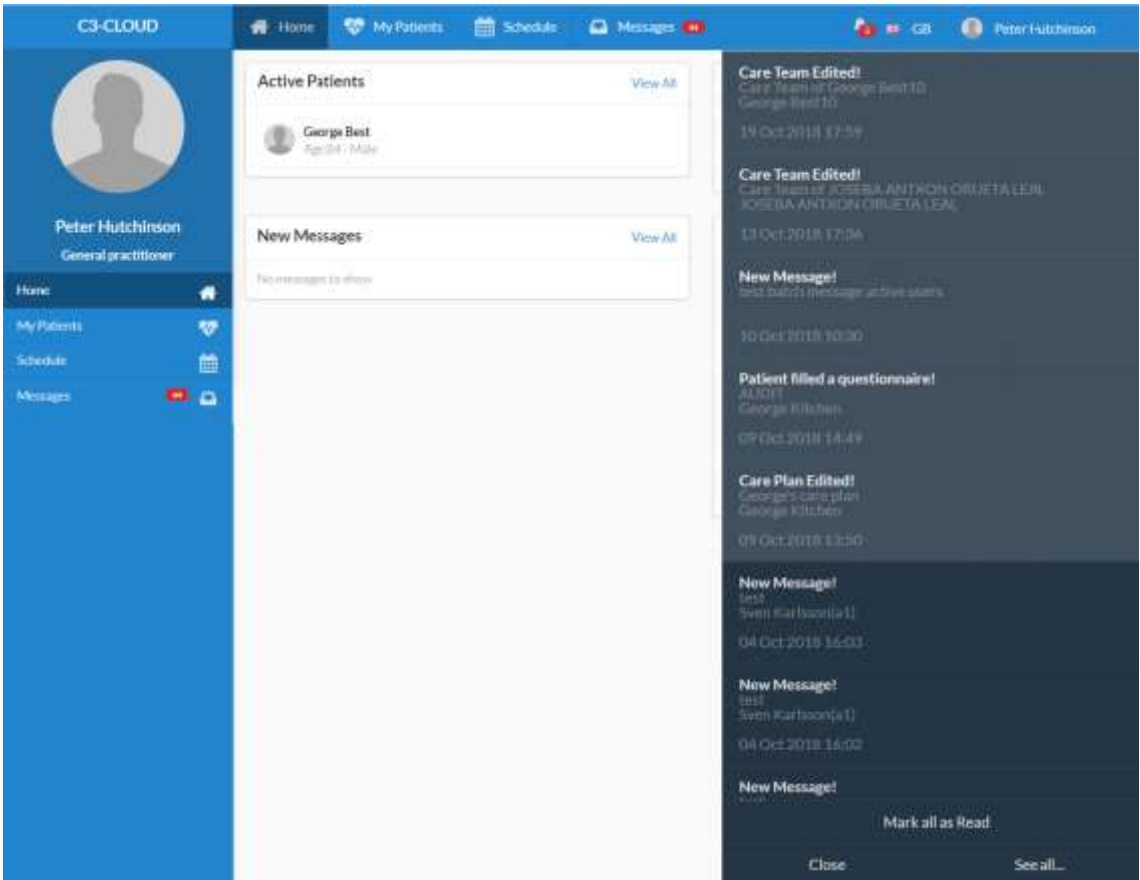


Figure 119. Display of most recent notifications

In addition, if you want to see all notifications including the old ones, you can use “System Notifications” tab in the messaging module (Figure 120). For example, all care team members are notified when a new care plan is created or edited (Figure 121).

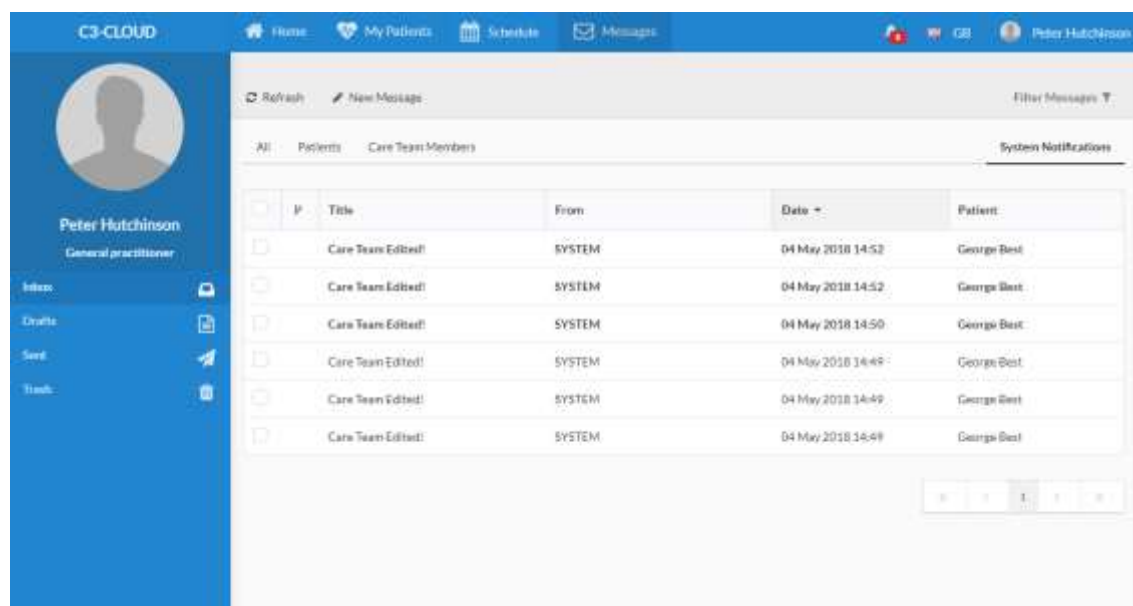


Figure 120. System Notifications

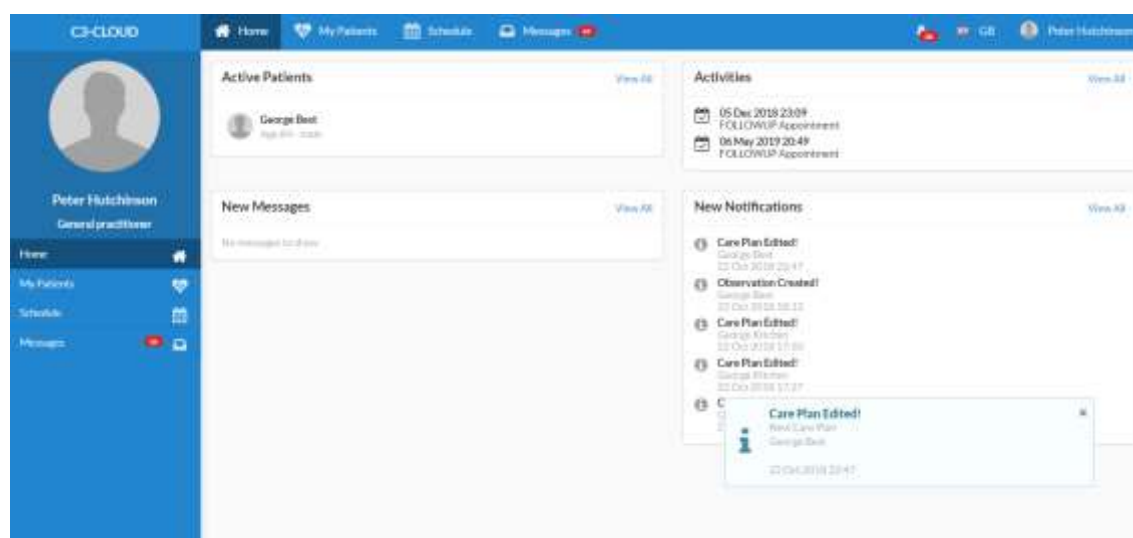


Figure 121. New care plan notification

Patient Provided Data

There is another component named ‘Patient Provided Data’ which shows the measurements, photos, questionnaire responses, messages, etc. provided by the patient themselves via the C3-Cloud patient system. You can pin specific observations you are interested in at the top of this page by clicking the “+” button or remove them from the top by clicking the trash icon (Figure 122). You can also see these observations of the patient either on a chart or as a table.

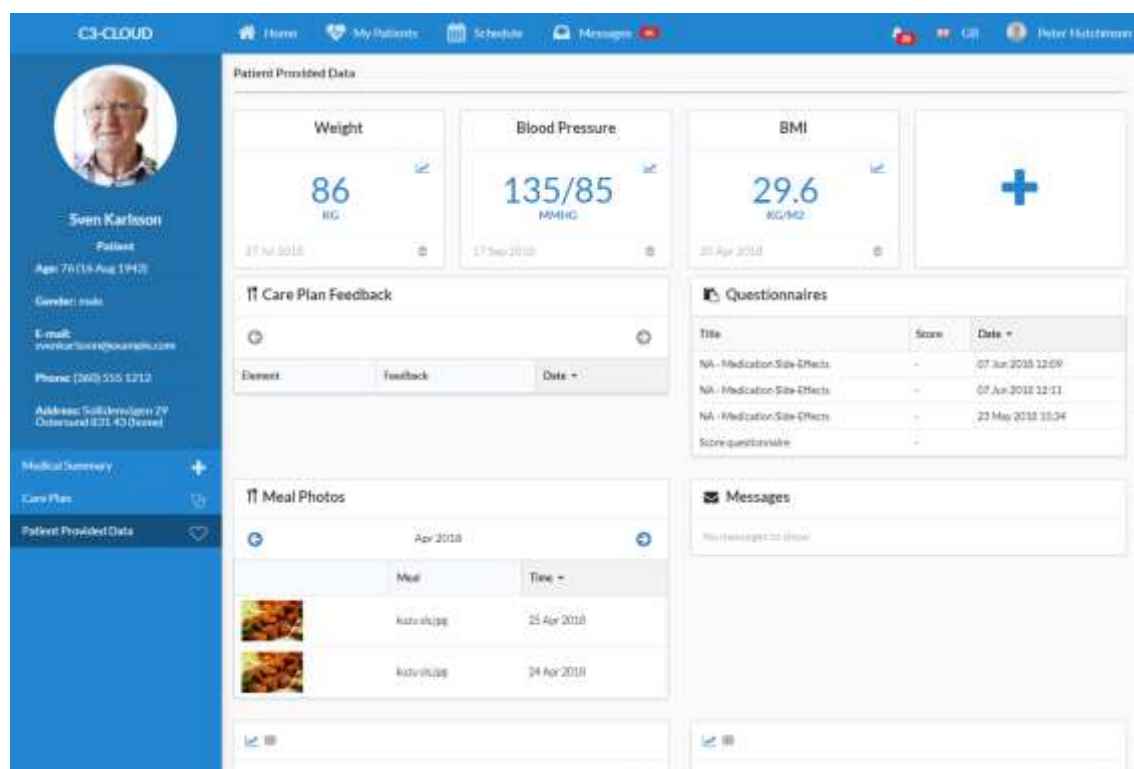


Figure 122. Patient Provided Data

4. TROUBLE SHOOTING

The error handling in the C3-Cloud system has been improved based on test data and experiences before the actual pilot operation, so that whenever there is an error, you will be informed about it via pop-up windows in the system. The system will not be blocked in such cases so that you will be able to proceed by using the system.

However, there can still be unforeseen cases during the real operation of the pilot that would break the system so that no appropriate error message can be provided. The system might be blocked in such cases so that your clicks to menu items or other links in the system can be unresponsive. In such cases, first try to log out from the system if it is possible. If not, please close the system completely by closing the web browser tab in which the system is open. There will be no data loss as the system is continuously saving the data you provide. In the worst case your last activity that caused the system to crash would be unsaved. You can then open a new tab and access the application again by opening its URL.

5. TECHNICAL SUPPORT

In case you encounter any unexpected error in the system or if you have any more questions regarding the system, please contact the C3-Cloud local project team through the following contact email: EMAIL ADDRESS OF ONE MEMBER OF THE PROJECT TEAM –TO BE UPDATED ACCORDING TO EACH PILOT SITE

Appendix 10 - Online video tutorials

1. STORYBOARD FOR THE ONLINE VIDEO TUTORIAL

The storyboard is structured in 4 sections: creation of a personalized care plan for the first time to a Patient (carried out in the professionals' platform-C3DP), visualization of the plan and “execution” of specific activities by the Patient according to the plan (in the Patient's platform-PEP), appointment to follow up and update the plan according to the evolution of the Patient (in the professionals' platform-C3DP) and the last section describing a few functionalities of both platforms are shown that are not included in the previous blocks.

The video tutorial consists of the following actions v1.1 (15/02/2019):

1. Initial consultation to create the care plan for the first time

1. HCP logs in the C3DP
2. HCP accesses the user manual in the Help bottom of the home screen
3. HCP finds the Patient for whom the care plan is going to be created for the first time
4. HCP reviews the medical summary of the Patient
5. HCP creates the personalized care plan in collaboration with the Patient
6. HCP manages the care plan
 - HCP adds a goal/activity/educational material
7. HCP sets out the date for the follow-up visit
8. HCP communicates with other MDT members
9. HCP ensures that the Patient is fully aware of what they need to do and when to manage their care plan and carry-out any goals and activities
10. HCP saves, activates and publishes the care plan of the Patient
11. Se le notifica al paciente que tiene un nuevo plan de cuidado

2. Patient is notified he/she has a new care plan

1. Patient accesses C3-Cloud System (PEP)
2. Patient accesses his/her plan
 - Patient views a goal
 - Patient views the active activities
 - Patient checks the assigned educational material
 - Patient sends a message to a the Care Plan Manager
 - Patient updates an activity of his/her care plan: questionnaire, measurements, other (e.g. meal photos)
 - Patient views his/her follow-up care review meeting: next appointments
 - Appointments should be removed from SWFT.
 - Questionnaires: each site has its own catalogue.

3. Follow-up consultation

1. HCP logs in the C3DP
2. HCP consults the main elements of the home screen: messaging, notification and schedule.
3. HCP finds the Patient care plan
4. HCP manages the care plan of the Patient
 - HCP Updates Patient data in each high level goals, if needed
 - Updating/adding a goal/activity/educational material

5. HCP tracks the changes made on goals/activities/educational materials by other care team members: Change tracking
6. HCP sees the comments made by the Patient: Patient feedback
7. HCP monitors Patient observations: Monitoring Patient observations
8. HCP reviews all the data provided by the Patient: Patient provided data
9. HCP saves and publishes the updated care plan of the Patient

4. Other functionalities

- a. C3DP:
 - Quick actions
 - Listing previous care plans
 - Care Plan Preferences
- a. C3-Cloud System (PEP):
 - Account settings (only for SWFT)
 - Feedback and technical support

2. CURRENT VERSION OF THE ONLINE VIDEO TUTORIAL

The current version of the online video tutorial and the subtitle file can be found at the following link.

C3DP: <https://www.dropbox.com/s/7yajdsbx3fugm2l/C3DPv2.zip?dl=0>

PEP: <https://files.warwick.ac.uk/c3cloud/browse/WP9/T9.4/PEP+videos>

Appendix 11 - User Manual of PEP for Pilot Site Coordinator (PEP Administrator guide)

1. INTRODUCTION











This document is aimed for administrative users of C3-Cloud PEP component. The document covers all online user interfaces provided for configuring and managing the component.

Advanced system (tech) administrator tasks that require access to the servers running the software are outside the scope of this document.

Quick start guide

This chapter provides an overview of the patterns and practices used in the admin workspace. Chapters focusing on individual features do not provide step-by-step guidance if the provided user interface is based on the common components described in this chapter, so refer to the quick start guide for general instructions.

The following icons are used throughout the user interface:

	Edit item
	Delete item
	Manage child items or additional settings
	Sort indicator (the list can be sorted by the column values)
	Drag-drop indicator (the item can be moved up or down in the list)
	Change password or other security settings
	Manage users or roles related to the list item
	Auto-complete field (suggestions are loaded during typing)
	Asterisk (indicates a mandatory field)
	Flag (indicates a language/region)

General instructions

Interactive lists are used for managing data items. The lists support paging, sorting and creating and modifying list items. Icons are used to indicate actions that can be performed for these items.

List example:

Monitoring device type management

Name ▾	Title ↕	Description ↕	State ↕	
AD_BloodPressure	A&D blood pressure	Bluetooth-enabled blood pressure meter	Active	<input type="button" value="edit"/> <input type="button" value="delete"/>
AD_Scale	A&D scale	Bluetooth-enabled scale	Active	<input type="button" value="edit"/> <input type="button" value="delete"/>

The keywords text box can be used to filter the list based on keywords. The columns included in the keywords search may vary; all columns are usually not included.

The list can be sorted by clicking a column heading that has the sort icon.

Note that searching and sorting are not supported for all lists/columns.

Multi-language features

All fields that have flag icons are multi-language values and must be entered in all active languages.

Example multi-language field:

Title *

2. SUMMARY OF C3-CLOUD PEP ADMIN TASKS

Common tasks at launch:

- Add the local information material links common for all patients
- Set the layout footer dialog content
- Create the local medication request links to additional information for your care plans
- Check the UI texts in your local language
- Check your local patient questionnaires
- Check your local measurement and other observation type configuration
- SWFT only: Create credentials for your patient users
- Manage the messaging teams for your patients

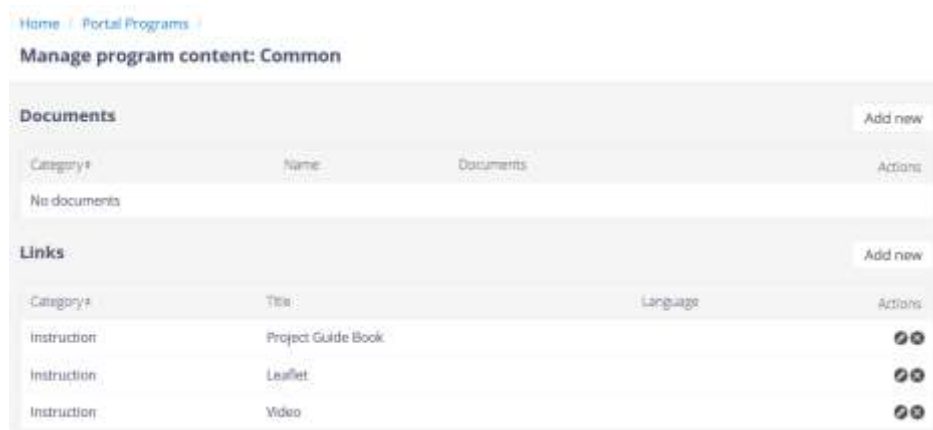
Content management and terminology

Common information material to all patients

You can add your local additional information available to all patients (general guides, training material, videos etc.). Open the portal program management section and there go to the program content section, where you can add all your common information materials.

See chapter *Portal programs* for additional details on portal program content management.

Example:



Footer dialog content and texts

You can set and manage the texts of each of content dialogs in the footer section.

Use the following dictionary term codes to access the current text you want modify:

- ID_TERMS_OF_USE_TEXT
- ID_PRIVACY_POLICY_TEXT
- ID_SERVICE_INFO_TEXT

See chapter *Dictionary management* for additional details on setting and localizing texts.

Note! The visibility of the footer links can be managed for each deployed environment in the system settings config group “**Layout.Footer.Visibility**”. This allows hiding any of the links not wanted in the deployed instance.

MedicationRequest product to additional information linking

You can set up your care plan MedicationRequest activities to display a link to additional info about the medication. Add for each medication you want to provide an information link for a coded value in the relevant PEP coded value subgroup “**CareplanMedicationLink**”. When adding the coded value, set in the Value field the medication product code as set in the care plan by C3DP and put the target link (the url) in the Display text field.

See chapter *Coded values* for additional details on coded value management.

Example: link metformin to metformin info on patient.info.

General dictionary management

You can manage (change) any of the text displayed in the solution; i.e. localise the preconfigured component dictionary and manage these texts during the lifetime of the deployed instance.

See chapter *Dictionary settings* for additional details on managing the application texts.

Coded value terminology

You can manage the texts of the coded values visible to patients. The coded values used by the pre-configured content installed as part of deployment.

Example: goal status texts displayed to patient.

See chapter *Coded values* for additional details on coded value management.

Data collection configuration and management

Questionnaire management

Finalize and maintain your patient questionnaires. Note! If you create or change questionnaires, the changes need to be synced to FHIR to display correctly in C3DP.

See chapter *Questionnaire management* for additional details on questionnaire management.

Observation type management

Manage the types of measurements and other observations the patient can enter as part of data collection. Essential local admin tasks are to ensure the only used ones are active and to verify the texts of the labels (titles and descriptions).

You can also add new types if needed. Please note that for new types if they are to be synced to FHIR, the relevant FHIR integration configuration must be updated.

See chapters *Observation management* and *Tracker management* for additional details on about observation type management.

People management

Patient record (patient as subject)

Automatically synced from FHIR when C3DP triggers Patient created or updated event. **No manual management foreseen.**

Note. In BC and RJH very important that the patient identifier in the patient record/data is the same as the identifier of the patient user provided by the local patient authentication service (JWT/BankId) when the patient logs in. Otherwise it's not possible to authorize patient to access own record. The patient record identifier is set in C3DP/FHIR and automatically synced to PEP.

Patient email address

The email address may be used for notifying the patient of events.

Note. Current understanding that email addresses captured at enrollment time, stored in FHIR and synced into PEP via integration. To be fully confirmed.

Patient as user

In SWFT, you create the patient login credentials (user id and password) using the admin tools and hand them over to the patient. See chapter *Patient user management* for additional details how to manage patient users locally in PEP.

In BC and RJH, logged in user is automatically matched to patient(s) based on id in user info and the patient id in the patient data (**no patient user management foreseen using PEP admin tools**).

Care team of patient

Automated syncing from FHIR triggered by C3DP events. Data copied to the extent needed in PEP functionality. **No manual management foreseen.**

Safe messaging teams

Use this to enable your patients to contact your organization (send new messages). You can add messaging teams, in which you map the patient and the professional in your organization, who receives the message(s) from the patient.

Note. Replying to message from care team professional member is always possible (this feature can be disabled in system configuration).

Note. C3DP/FHIR lacks the “service” concept the consortium desires and which would allow a patient’s message to go to a group of professionals. Therefore, in C3-Cloud do not setup messaging teams with more than one professional.

Note. Semi-automation of team creation discussed by pilot partners. To be confirmed as a feature.

See chapter *Messaging teams* for additional details.

3. GENERAL SETTINGS (TERMINOLOGY & CONCEPTS)

Dictionary

Dictionary provides online tools for managing the texts shown in the user interface and included in the messages sent by the service. All texts are stored in the application database.

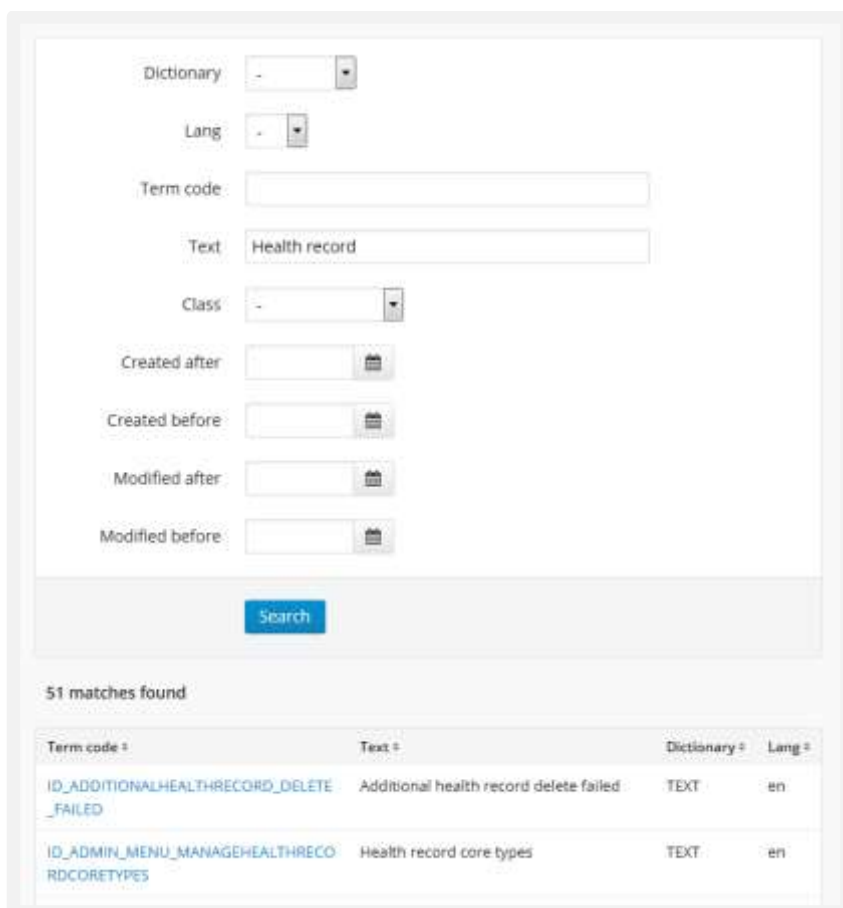
Each dictionary term is identified by a unique Term code. When a text is displayed in the user interface, the software requests the localized texts for each term included on the page. The dictionary tools allow the users to fill in localized texts in all active languages (language activation is outside the scope of this document). The changes take effect immediately.

Dictionary management can be found from “*General settings > Dictionary*”. Two techniques are provided for customizing the texts: dictionary search and dictionary edit mode. Both techniques are described in the following chapters.

Search the dictionary

A form is presented for searching terms used in the service. The term can be searched by the term code or localized text. A partial term code or text can be used.

After submitting the form, all matches are presented and links for editing each term are provided.



The screenshot shows a web interface for searching the dictionary. It includes several input fields and a search button. Below the search form, it displays the number of matches found and a table of results.

Search Form Fields:

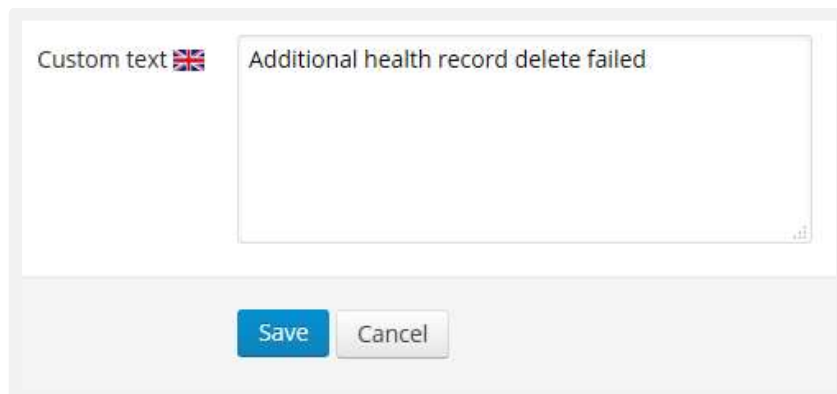
- Dictionary: -
- Lang: -
- Term code:
- Text: Health record
- Class: -
- Created after:
- Created before:
- Modified after:
- Modified before:
- Search button


Results: 51 matches found

Term code	Text	Dictionary	Lang
ID_ADDITIONALHEALTHRECORD_DELETE_FAILED	Additional health record delete failed	TEXT	en
ID_ADMIN_MENU_MANAGEHEALTHRECORDCORETYPES	Health record core types	TEXT	en

Edit dictionary entry

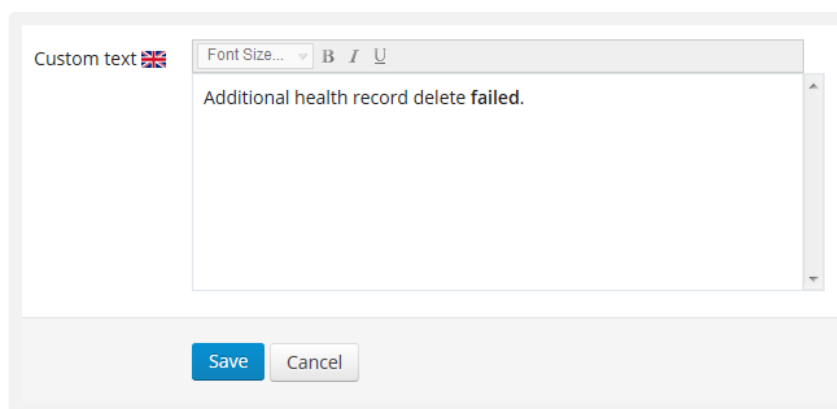
When editing an entry, the localized texts can be supplied in all active languages.




Custom text  Additional health record delete failed.

Save Cancel

Enabling rich text gives the ability to format the text:



Custom text  Font Size... **B** *I* U

Additional health record delete failed.

Save Cancel

WARNING! Do not change an existing term that doesn't include any markup to rich text! It will not be shown correctly and may cause malfunctions.

Add new dictionary entry

Note that adding new dictionary entries is only relevant when the service is customized. Without new or modified custom pages or messages, the new term will not be shown anywhere.

To prevent multiple similar entries, the link for adding a new term is presented only after performing a search. If no entries are found **when searching by term code**, a link for adding a new entry is provided.

Term code: ID_NOT_FOUND

Text:

Class: -

Created after:

Created before:

Modified after:

Modified before:

Search

0 matches found

Term code	Text	Dictionary	Lang
No matches were found			

[Add new entry](#)

The same dialog is used for adding and editing the entries.

Enable dictionary edit mode

Dictionary edit mode can be activated on the main page of the Dictionary section. After activating the edit mode, the texts on the user interface can be changed by right-clicking them. The right-click editor does not work for all terms due to technical restrictions, but it can be used to manage most texts.

Coded values

Coded values are used to improve the quality of the data entered into the system. A data item or item property can be mapped to a predefined code. This enables the service users (and external services) to have a standard way of encoding the data, which is essential for data integrity and interoperability.

Each code is defined by the following properties:

- **Family:** High-level type of the code set (e.g. "RxNorm" or "ICD")
- **Vocabulary:** Identifies the specific code set (e.g. "ICD-10" or "RxNorm Active Ingredients")
- **Version:** Version of the code set (e.g. "1.0")
- **Region:** Region where the code is used (e.g. "US", "FP", or "Global" for global codes)

Additional field *Subgroup* is used to divide the codes into groups that are known to the service. Each code belongs to a single subgroup. This grouping allows the service to be ignorant of the actual code sets loaded into the system. In features where a list of codes must be shown or loaded into a suggestion

field, the codes are always queried by subgroup. For example, when suggesting medications based on a partial medication name, the search is restricted to codes in subgroup “MedicationName”. The code sets used for medications may be completely different in different regions, but the software always loads the correct codes based on the subgroup information.

While the codes differ by region, certain code sets can be used in several regions or in several languages. *Display value* and *Abbreviation* are multi-language fields that provide localized display texts for the codes.

Only a core set of codes is pre-loaded into the system, but publically available code sets can be run into the system according to customers’ requirements. A license may be needed for some code sets.

Manage coded values

The list provides all the standard features for viewing, creating, editing and deleting coded values.

Import/Export tools

NOTE: Import/Export tools are aimed for advanced system administrator users and require knowledge of the underlying database structure.

Import/Export tools are provided for managing multilingual/regional content. The tools allow the users to manage the data in large quantities, using text-based files for data transfer. They can be used for populating a new instance, upgrading an existing instance to a new version, or for adding a new language, region or content package.

The tools are divided into three sections: Multi-language data, Dictionary and Coded values.

The Multi-language data section supports managing data that contains multilingual content, such as health record item types, programs and questionnaires. When adding a new language, translations must be provided for all multilingual data. The data must also be upgraded when adding a new content package.

The Dictionary section supports importing and exporting dictionary content (see chapter Dictionary). Dictionary contains “static” multilingual content, i.e. the texts shown on the web pages or messages sent by the service. In normal circumstances the dictionary only needs to be updated during a version upgrade or when adding a new language. Import/export tools are provided for managing large amounts of entries. For customizing individual texts, use the tools described in chapter Dictionary.

The Coded values section supports importing and exporting coded values (see chapter

Coded *values*). Use the tool to import a new code set into the system or export a code set to import it into another instance.

Although single entries can be managed in other sections of the administration interface, it is impractical to insert or update large amounts of data using the other tools. Import/Export tools offer the possibility to perform these changes on a larger scale. Only one language can be edited at a time, but multiple values can be processed simultaneously. The data is exported and imported as csv (comma-separated values) files. See chapter Technical info for information on the exact file format.

Note that adding a completely new region or language may require additional tasks not covered in this document, such as creating a new custom culture on the server. Please contact your product vendor for additional information.

Import and export data

All three sections have a practically identical interface (see image) containing an export tool and an import tool. Export tool offers three choices for the export action: *Language to translate*, *Reference language* and different search fields depending on the current section of Import/Export tools. English values are always fetched as a reference so selecting English as the reference language is, although possible, unnecessary. When the send button is pressed the server will produce a csv file.

Import tool has only two fields: *Updated language* and *Choose a file*. Updated language indicates the language to update and the file field indicates the file that contains the data to update and/or insert. After uploading the file the user is redirected to a page where the uploaded data can be reviewed and finally saved in the database.

Import/Export tools can be used for modifying existing data or inserting entirely new data (only applies to Dictionary and Coded values). When importing, it is a good practice to always perform an export first to get a properly formatted csv-file as a reference.

Technical info

The csv-files should be encoded in Unicode, preferably with a BOM-header. The column separator must be a semicolon. The data is mapped with column headers so the column headers must not be changed.

When you wish to import data into the system, first perform an export and use the exported file as reference to ensure the file format and syntax is correct.

Not that the texts cannot contain semicolons as they are used as column separators. If you encounter problems with semicolons or other special characters, remove or replace the special characters and try again.

4. PROGRAMS

Portal programs

The core functionality and information model are designed to be as condition-independent as possible, to leverage the use of the product for a wide range of different uses. To provide context to the individual features, the patient user is provided with an option to choose their favorite content.

These content groups can be created with Portal programs. You can select *trackers*, *health record items*, *questionnaires*, *reports* and *coaching programs* to be included in a Portal program.

Each program can be configured to include only the relevant content and functionality. It enables creating a focused view for a specific context/condition. Examples of Portal programs are *Diabetes* and *Hypertension*.

Use the “Assigned to all” option to automatically activate a program for all the patients.

Manage content categories

All the links and documents added to the Portal programs are categorized. The categories are configurable and can be managed in this section.

To edit the categories, click “Edit content categories”. You are presented with a list of content categories.

To add new category, click “Add new”. Fill in the form and press “Save” to add the category.

Content category field descriptions:

- **Id:** Identifier for the category, used for internal references
- **Display name:** Localized display name, shown to program members
- **Description:** Localized description, shown to program members


Create a Portal program

To add a new program, click “Add new” and fill in the form fields.

Field descriptions:

- **Program id:** Unique identifier for the program
- **Title:** Localized title shown in the user interface
- **Description:** Localized program description
- **State:** Indicates whether the program is active or inactive, inactive programs are not shown the users
- **Trackers:** Select trackers (=observations) that are relevant to the program
- **Questionnaires:** Select questionnaires that are relevant to the program
- **Reports:** Select reports that are relevant to the program
- **Health record items:** Select core health record item types that are relevant to the program

Trackers, questionnaires, reports and health record item types are global items so they can be selected with the multi-select lists.

Program content (documents and links) is always related to a single program so it has to be added separately. To manage program content, click the  icon on the actions column in the program list.

5. DATA COLLECTION

Questionnaires

Questionnaires can be used to gather various types of information related to the patients/members. The information model is dynamic and uses the same techniques as observations (see chapter

Observation *types*). Questionnaires are often used after patient enrollment to collect a base set of data related to the patient, or to track the progress made with the treatment or personal coaching. Questionnaires are presented to the users within Programs.

A single *questionnaire* consists of multiple *question sets*, which again contain multiple *questions*. Question sets are used to group a set of questions in the user interface. Each question set is presented on a single page in the web interface.

All questionnaires are presented using predefined layouts and styles. The management interface does not provide options for customizing the layout. Presentation logic and answer processing workflows can be tailored in customer projects, but this requires add-ons with custom program code. Contact your product vendor for additional information on this.

Manage questionnaires

Questionnaire management consists of three different list views. *Questionnaires*, *question sets* and *questions* all are managed on separate lists. To manage the question sets of a questionnaire or questions of a question set, click the “Manage child items” icon on the list.

Questionnaires are managed using the standard list component. The Create and Edit views contain a lot of fields, but many of them are only relevant in advanced scenarios including custom program code. If a questionnaire has been answered, its editing features are restricted. (*See Questionnaires Author’s Guide for additional information*)

Questionnaire field descriptions:

- **Id:** Id of the questionnaire. Needs to be unique and is used in the URL for answering the questionnaire. Not shown to the user.
- **Title:** Localized questionnaire title
- **Description:** Localized questionnaire description
- **Web instructions:** Instructions that are shown in the web interface when filling in the questionnaire
- **Answer review:** Indicates whether the users should be presented with a review page before confirming the answers.
- **Store partial answer:** Indicates whether partial answers should be stored. Not used in the default product configuration.
- **Answer completed message (web):** Message shown to the users after filling in the questionnaire
- **Show navigation links:** Indicates if the users should be able to freely navigate between different questions in the questionnaire. If set to false, only the Next link is shown on each page.
- **CSS:** Add questionnaires specific CSS.
- **On-Completed Client Script:** Add questionnaire specific custom Javascript.
- **On-Completed Server Script:** Add questionnaire specific custom server side script.

Manage question sets

Question sets management is very simple because question sets are basically only a means to categorize the questions. Questions are managed through a list view very similar to questionnaires management. Questions also have basic actions: create, edit and delete and a child action that leads to questions management. Question sets' order can be changed dragging and dropping list rows into a different order. This also changes the display order of question sets in the web interface. There also is an option to preview the questionnaire in web interface.

Question sets have the following properties:

- **Id:** Question set id, not shown to user.
- **Title:** Localized title
- **Description:** Localized description

Manage questions

Questions are also managed through a standard list view with an option to preview the question set in answering mode. The list also support drag and drop functionality to order the questions. The management page has multiple Add-buttons for creating different types of questions. There are eight possible types of questions: *choice*, *yes/no*, *text*, *number*, *date/time*, *observation*, *codable value* and *file*. Certain properties are shared by all of question types, but each type also has fields that are specific to the type. The common field will be discussed first and then all different question types individually.

Questions use the same dynamic property technique as observation items. Only the *Observation and Date/time* types, which are specific to the Questionnaires module, are described in detail here. Descriptions of the dynamic types and associated fields can be found in the sub-chapters of chapter Add new or edit an existing observation item type.

Common question fields

Field descriptions:

- **Id:** Question Id. Not shown to user.
- **Title:** Localized title
- **Description:** Localized description
- **Comment field:** Indicates whether a comment field is attached to the question allowing the user to input a freely formed comment with the answer
- **Previous answer as default:** The field is only applicable if a user is allowed to answer a questionnaire more than once. This can be set in the questionnaire settings. If the property is set to 'Yes', then the user's previous answer is shown as the default answer.
- **Example text:** Example answer shown with the question
- **Answer required:** If the property is set to 'Yes', the user cannot proceed without answering the question.
- **Visibility:** Defines who can see the question.
- **Answering:** Defines who can answer the question.
- **Section id:** Section id can be used to group questions within a question set. All questions that have the same question id are shown in the same section. Each section can have a dictionary-based title and description. The relevant dictionary codes are shown in Preview mode.

Important: questions with the same section id must be ordered sequentially (one after the other)!

- **CSS classes:** Add CSS-classes to customize the UI.
- **On-Load Script:** Add custom Javascript. This script is triggered when the page is loaded.
- **On-Change Script:** Add custom Javascript. This script is triggered when the question answer is changed.

Date/time question type

Date/time question can be used to collect a date or date and time.

Date/time specific properties:

- **Default value:** Set to “None” if no default time should be shown, or “Current time” for using the current date/time as the default value.
- **Format string:** Use “d” for date, “g” for date and time

Observation question type

Observation question is different from the other types as it requires the user to select an observation and an observation item. Question presentation depends on the observation item properties.

When a user answers a question set that contains observation questions, the questions are stored normally, but an observation is also created. Observations consist of one or more observation items. **Add all required observation items in the same question set or the observation will not be stored properly!**

After selecting the observation item type, you are presented with a form that contains properties relevant to the selected item type. Some properties, like min and max value for the measurement item type, are presented as read-only fields and cannot be overridden.

Sample questionnaire

First question set:

How much exercise do you get daily?
<input type="text" value="Averagely"/>
Have you broken bones recently?
<input type="radio"/> Yes <input type="radio"/> No
Describe your dietary habits shortly <i>Give one sentence summary of your dietary habits regarding vegetables, saturated fats and milk products.</i>
<i>Lost of vegetables, a little fats and plenty of milk products</i> <input type="text"/>
How many deciliters of milk do you drink daily? <i>An approximate of the amount of milk you drink daily.</i>
<input type="text"/>
Comments
<input type="text"/>

The screenshot above shows a pattern of example questions. The question set contains a choice question, yes/no question, text question and number question. The text question has a description and example text defined while the number question only has a description text. The text question also includes a comment field for supplying additional information related to the answer.

Second question set:

When was the last time you visited a doctor?
<input type="text"/>
How many cigarettes you smoke daily? *
<input type="text"/> smokes / day
Who directed you to this questionnaire
<input type="text"/>

The second question set presents samples of the remaining question types: *Date/time*, *observation* and *codable value*. The observation question has been marked as required, which is indicated with the asterisk (*).

Observation types

WARNING! Observation types should not be modified in production systems! A mistake made while editing may cause a critical service malfunction. Always perform the changes in a staging environment and use SQL scripts to populate the production database.

Observation types define the types of health-related data that can be stored for service members (patients). All collected health data must map to a type that is defined here. Each collected data item is person-specific.

Observation types can be created and modified freely. However, use caution when modifying existing observation types as this can result in a critical system malfunction. For example, The Id of an existing type must not be changed as there may be data or code that references it.

Observation types are dynamic, but the release contains a common set of observation types, such as weight, blood pressure and blood glucose. See document *Medicine Suite Reference Content* for a full list of observation types included in the release. Do not make changes to the predefined types, except for display texts.

Each observation type has one or more observation items that define the details of the data that can be collected with the type. All observation type and item type fields are described in the next chapters.

After creating an observation type, remember to create a tracker for the observation (see chapter 4.7). Otherwise the observation type has very limited visibility in the patient and health care professional user interfaces.

Manage observation types

Observation type list contains a link for exporting the list to PDF. The PDF can be printed or delivered to application developers who access the APIs provided by the product.

Add new type or edit an existing type

Field descriptions:

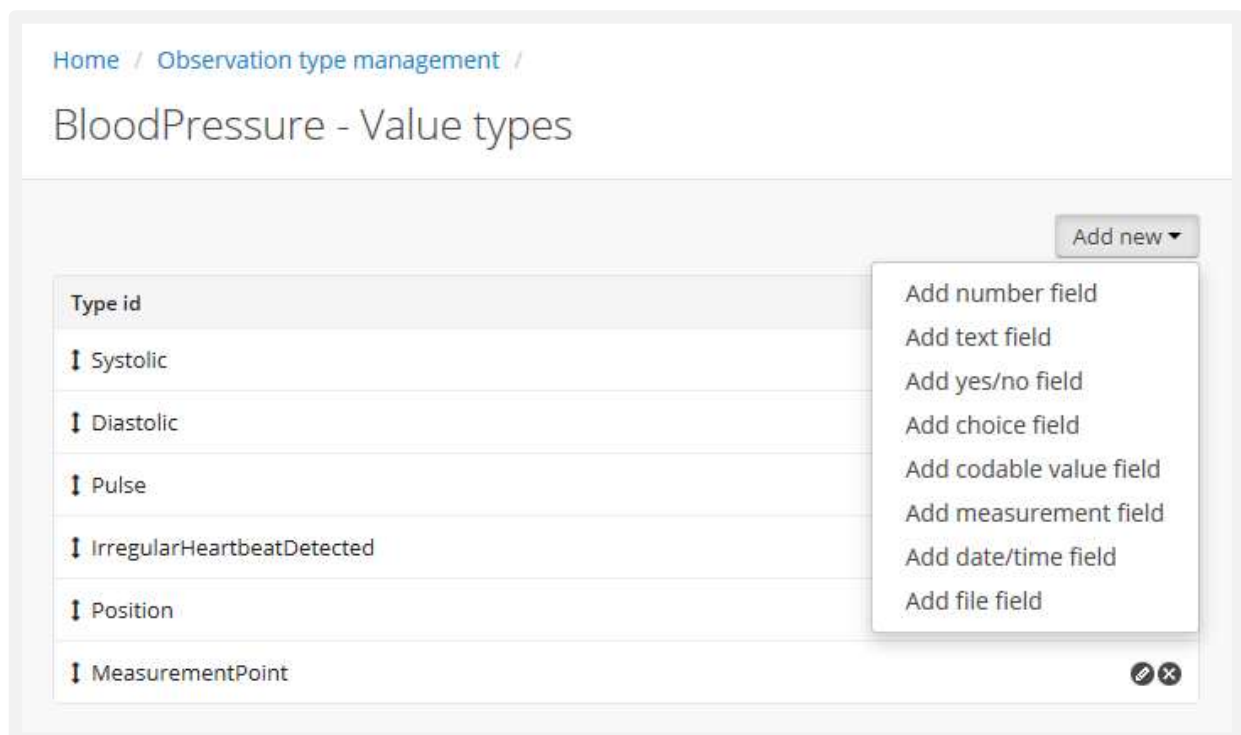
- **Type id:** Unique human-readable Id (e.g. BloodPressure), used to identify the type in workflows and API calls.
- **Entity class name:** Custom entity class name, advanced field whose value should not be changed
- **Title:** Localized title, shown in the user interface
- **Description:** Localized description of the type, available via the API
- **Instructions:** Instructions for using the type, available via the API
- **Date format:** Indicates how the effective date/time of the record should be formatted in the user interface. Use “g” for date and time, “d” for date only. *NOTE: The corresponding Tracker setting takes precedence over this setting.*
- **Code:** Can be used to link the type to a coded value, available via the API.
- **State:** Indicates whether the type is active or inactive. If you inactivate a type, remember to inactivate the associated tracker (see chapter 4.7.).
- **Allow manual add:** Allows manual add in the UI.
- **Show notes field:** Whether to show notes text field in the UI.
-

Manage observation items

Click the middle icon in the Actions section of Observation type list to manage the *observation item types* of an observation type.

Each observation consists of one or more observation items. Each observation item stores one value.

Observation items of type BloodPressure:



To add new observation item Click Add new to select observation type. Note that new observation items can't be added to an observation which already is in use.

You can drag and drop rows to change order.

Add new or edit an existing observation item type

Common fields for all observation types:

- **Type id:** Id for the item type (e.g. Systolic), must be unique within the observation type
- **Title:** Localized title, shown in the user interface
- **Description:** Localized description of the type, shown in the user interface and available via the Web Services API
- **Example text:** Localized example text, shown in the user interface and available via the Web Services API
- **Answer required:** Indicates whether the item is mandatory or not
- **Code:** Can be used to link the type to a coded value, available via the Web Services API
- **Show in lists:** Indicates whether the item should be included as a column in observation lists
- **Show in forms:** Indicates whether the item should be included in forms for creating or editing an observation
- **Show in chart:** Indicates whether the item should be included in charts that are used track observations

Each type contains fields that are specific to the type. These fields are discussed in the following chapters.

Number type

Number type is used to collect numeric input. The input can be either freely typed numbers or selected with a select list or a slider. Number type accepts a single number and only allows the minimum/maximum values and interval to be configured.

NOTE: Prefer Measurement items over Number items to improve the quality of the data. The Number item type should only be used for ad-hoc types in pilot projects.

Additional fields for number items:

- **Default value:** Default value, field will be prefilled with the selected value if given
- **Presentation format:** Either number input field, number selector or number slider. Number input field allows the user to type the value in. Number selector shows a drop-down list of choices and number slider displays a slider with specified intervals
- **Show latest value as default:** Indicates if the latest observed value for the person should be used as the default value
- **Minimum value:** Minimum value allowed (number)
- **Maximum value:** Maximum value allowed (number)
- **Step (interval) for selector:** Indicates the step to use in a number selector field (example: min 1, max 5, step 2 → selector contains values 1, 3 and 5)
- **Format string:** Defines the presentation format for the number, use {0:0} for integer or indicate the number of decimals to show using “#” characters (e.g. {0:0.##} for showing 0-2 decimals depending on the value)
- **Unit code group:** Coded value subgroup (see chapter
- Coded [values](#)) that contains the unit(s) available for this type
- **Default unit:** Default unit must be defined. Always use an SI unit if available! The Web Services API will only accept values in the default unit, or a corresponding US unit.

Text type

The text type is used to gather free-text input from the user. The text item can also be made read-only, in which case the text is only displayed to the user.

Additional fields for text items:

- **Presentation format:** Text field, text area field or read-only field. Text field is a single line, text area field resizable multi-line text field and read-only merely displays the default value without presenting an input-field.
- **Default value:** Default value, field will be prefilled with the selected value if given
- **Min length:** Minimum length allowed for the text (in characters)
- **Max length:** Maximum length allowed for the field (in characters)

Yes/No type

The Yes/No type is very simple. It presents the user with two choices, yes and no.

Field descriptions:

- **Default value:** Default value, field will be prefilled with the selected value

Choice type

Choice type presents the user with a list of choices. There are three options on how to display the choice question: radio button list, check boxes and a select list. Radio button list displays all the choices of which the user can select one. Select list presents a drop-down list from which user can select the answer. Checkboxes allow the user to select zero or more choices.

Additional fields for choice items:

Presentation format: Radio buttons

Min choices:

Max choices:

Answer choices ^

Choice id *	Choice description *
<input type="text"/>	<input type="text"/>

Default answer: ☐ Yes ☒ No

+ Add new

Field descriptions:

- **Presentation format:** Indicates the field type to use in create/edit forms (radio buttons, check boxes or select list)
- **Min choices:** Minimum amount of choices. With radio the only possible value is 0 and with select list 0 or 1
- **Max choices:** Maximum amount of choices. With radio button and select list the only possible value is 1

- **Answer choices:** Choice values available to the user
 - Choice id: Id of the choice
 - Choice description: Choice description, available via the Web Services API
 - Default answer: Default answer of the choice

By default answer choices are displayed in the order they were entered in. If you later wish to change the order, you can select the “Sort choices” option in the top right corner of the question edit form. Use drag and drop to sort the choices. It should be noted that the order of choices in the answer choices editor is not significant and the order can afterwards be seen only in the sort choices view.

NOTE: Prefer codable values over choice items to improve the quality of the data. Codable value “choices” can be defined in the Coded values section. The Choice item type should only be used for ad-hoc types in pilot projects.

Codable value type

Codable value type lets the user select the choices from a predefined set of coded values (see chapter Coded *values*). The values can be selected using an autocomplete lookup or a drop down list.

Additional fields for codable value items:

- **Presentation format:** Indicates the field type to use in create/edit forms (select list or autocomplete)
- **Default value:** Default value, field will be prefilled with this value if given, usually not applicable for codable values
- **Code group:** Indicates the subgroup for the applicable coded values (see chapter Coded *values*)

NOTE: If autocomplete is used, the user has the option of providing a text that does not exist in the code set (hence the term *codable* value). To disable this feature and force a selection, use a select list instead.

Measurement type

Additional fields for Measurement items:

- **Default value:** Default value, field will be prefilled with the selected value if given
- **Show latest value as default:** Indicates if the latest observed value for the person should be used as the default value
- **Minimum value:** Minimum value allowed (number)
- **Maximum value:** Maximum value allowed (number)
- **Step (interval) for selector:** Indicates the step to use in a number selector field (example: min 1, max 5, step 2 → selector contains values 1, 3 and 5)
- **Format string:** Defines the presentation format for the number, use {0:0} for integer or indicate the number of decimals to show using “#” characters (e.g. {0:0.##} for showing 0-2 decimals depending on the value)
- **Unit code group:** Coded value subgroup (see chapter Coded values) that contains the unit(s) available for this type
- **Default unit:** Default unit must be defined. Always use an SI unit if available! The Web Services API will only accept values in the default unit, or a corresponding US unit.

See <http://msdn.microsoft.com/en-us/library/0c899ak8.aspx> for more information on format strings.

The software includes a unit conversion engine that performs SI-US-SI unit conversions automatically. **Do not use a US unit as default unit or the conversions will not work properly!**

Trackers

Trackers allow the patients and health care professionals to activate observations for tracking. Each tracker type is always connected to a single observation type. When a tracker has been activated for a patient, the patient or health care professionals can set personal limits for the patient and view charts including the tracked observations.

Note! The observation type is not shown anywhere in the patient context, unless a tracker has been created for it.

Tracker management

Tracker administration page is a standard list view. Trackers can be viewed, created, edited and deleted via the interface.

Trackers have multiple configuration properties that are listed below.

- **Name:** Used as an identifier for the tracker, not shown to user
- **Observation type:** Indicates the observation type that should be tracked
- **Title:** Localized title for the tracker
- **Instructions:** Instructions on how to use the tracker, not shown in the default product configuration
- **Relevant info:** Other information relevant to the tracker, not shown in the default product configuration
- **Chart type:** Indicates the type of chart to use for showing observation trends (Line, Column, Bar, Stacker column or Stacked bar)
- **Enable limit:** Indicates whether the user can set a limit for the tracker (e.g. for observation type Height a limit is usually unnecessary)
- **Enable low limit:** indicates if low limit can be set for the observation (applicable for types, such as Exercise)
- **Enable medium limit:** indicates if medium low limit can be set for the observation
- **Enable medium high limit:** indicates if medium high limit can be set for the observation
- **Enable high limit:** indicates if high limit can be set for the observation (applicable for types, such as Alcohol).
- **Enable organizational limit:** Can an organization-level limit be set for the observation. Organizational limit are used as default limits in population reports and charts for patients that do not have a personal limits set.
- **Date format:** Indicates how the effective date/time of the observation should be formatted in the user interface. Use “g” for date and time, “d” for date only.
- **Initial value:** Is the user’s previous observation shown as the default value in observation creation.
- **Target date:** Indicates whether the possibility to set a target date for the goal should be presented to the user (not in use in new limits system)
- **State:** Only active trackers are shown to the users, inactive trackers are hidden
- **Custom tracker list content:** Advanced technical field, only applicable if custom code exists for the tracker

6. PEOPLE

Patient and patient user management

Patient records are used to store all the patient related data.

Patient users are the user accounts created to allow patients to access their data. To manage these user accounts, select “People > Patient” from the admin menu.


To create a patient user, click for the selected patient on the “Create credentials”-icon. Fill in the form and press “Save”.



Alternatively, you can use the invite-functionality to provide your patient with access. To provide patient or patient's family members or care givers access to patient record, you can use the invite functionality. Click the envelope icon and select who you want to grant access (patient or informal caregiver). Fill in the invitation details. If you don't use the "Send invitation code as text message" – option, you need to provide the invitation code some other way. The invitation code is needed when the invitee signs up as a user.

When the person receives the invitation, he is advised to login or create a user account, if the person is not yet a registered user of the service.

To manage these user accounts, select “Patient users” from the submenu.

To reset/change the password, click the  icon in the list.

To inactivate a user account, click the  icon in the list. Inactive users cannot access the service.


You can find all inactivated users by the clicking “Manage inactive users”- link below the “Patient Users”- list. There you can reactivate a user by clicking the  icon or permanently delete a user by clicking the  icon on the row.

Note! Reactivating a deleted user requires direct database access and can only be performed using SQL script. To delete a user, associated data and history information from the database completely, contact your system administrator.

Messaging teams

Messaging team groups the care professionals who work together and the patients that are allowed to communicate with that team.

If a patient is not a member of the messaging team, patient cannot send messages to that team.

To manage members, click the  icon and select the patients and the professionals for the team. Use the look-up fields to assign patients and professionals. You can use a partial name to lookup the person.

After the assignments have been made, press “Save” to confirm the changes.

If the team includes a lot of members, use the “Filter list” field to search for existing members.

Appendix 12 - User Manual of C3DP for Pilot Site Coordinator (C3DP Administrator guide)

1. INTRODUCTION

C3-Cloud Care Plan Management System for Health Professional, i.e. the C3DP, provides some content management and overall configuration functionalities to be used by the Pilot Site Coordinators or Administrators. Administration interface of C3DP enables performing such interventions in a user-friendly manner. It also keeps some statistics that will be used for the evaluation purposes. The functionalities can be summarised as follows:

- Registering new health professional users into the C3-Cloud SPS Identity Provider (to be used for those who cannot access via their existing user accounts)
- Monitoring and modifying basic data of patients and health professionals stored in the system
- Monitoring the basic statistics of care plans created in the C3-Cloud system
- Monitoring audit logs (login/logout) and time periods of the user sessions
- Managing value sets, education materials and locations used in the system
- Sending administrative messages to the users as batch messages (to be used mainly for sending evaluation questionnaire completion requests)
- Triggering the refreshing of the concept mappings in the database

This document includes a complete series of all the possible functionalities that a Pilot Site Coordinator is able to perform. It presents a complete demonstration of the C3DP Administration Interface for the management of the system.

2. USE OF THE C3DP ADMINISTRATION INTERFACE

Accessing The C3DP Administration Interface

The C3-Cloud system is an online system which you can access using the Internet with a modern, standard web browser (Chrome, Firefox, Edge, Safari). You don't need to download any software to use the system. Note: THE SYSTEM DOES NOT WORK WITH INTERNET EXPLORER.

The C3-Cloud system is available to you at the local address for each site. Please save this link to your favorites in your browser so that it is easy to access each time.

When you open the C3DP tool in your web browser, you will be forwarded to the login page (Figure 123). You should click the “Administrator Login” button at the top for accessing the administration interface.

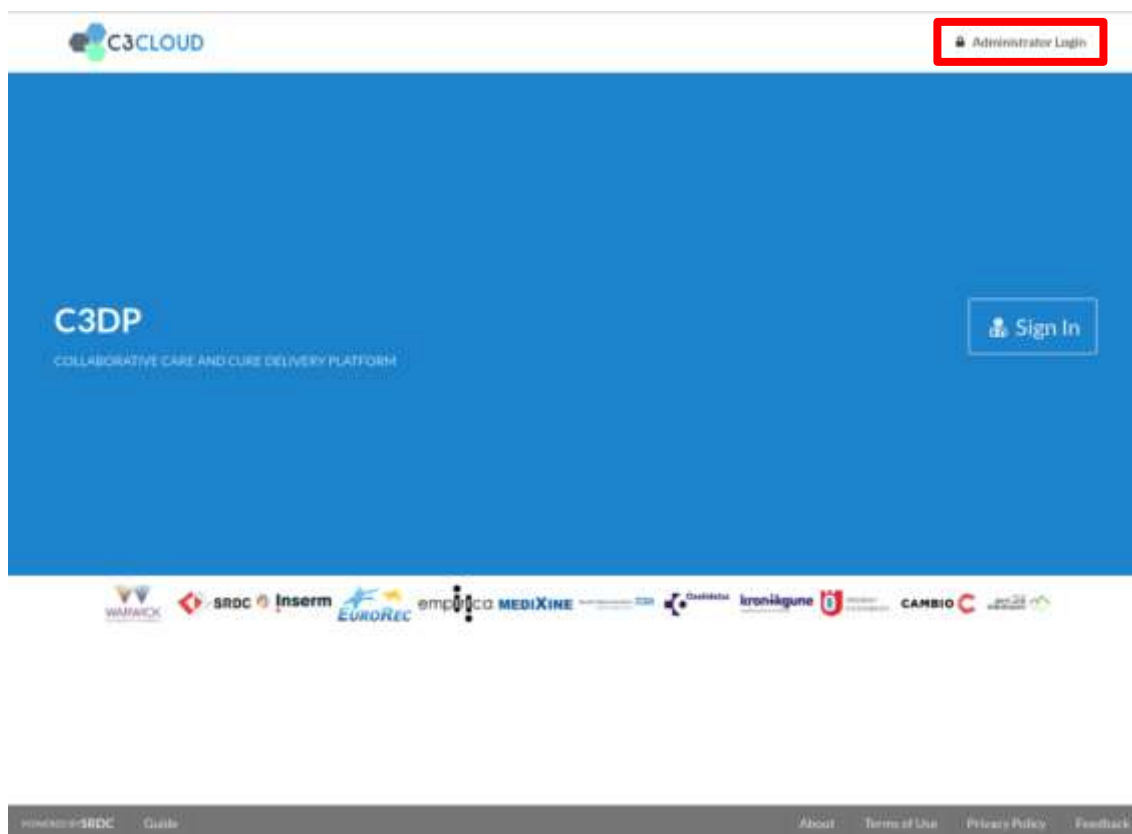


Figure 123 - Login Page

Then, you will be redirected to the “C3-Cloud Security and Privacy Suite” to be authenticated. There will be deployment-specific authentication options on this page. Click on the “Continue With C3-Cloud IdP” button (Figure 124) and log in using the administrator credentials provided to you. Each site will be provided with one administrator account.

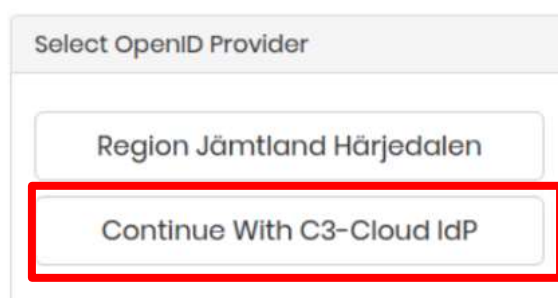
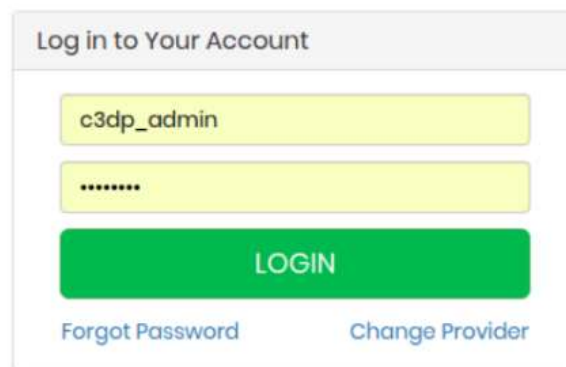


Figure 124 - SPS Login Options



Log in to Your Account

c3dp_admin

LOGIN

[Forgot Password](#) [Change Provider](#)

Figure 125 - SPS Login Screen

Home Screen

After you are authenticated, you will be redirected to the admin interface of the C3DP (Figure 126). There are quick access buttons to the administrator functionalities on the screen and you can also navigate using the side menu on the left.

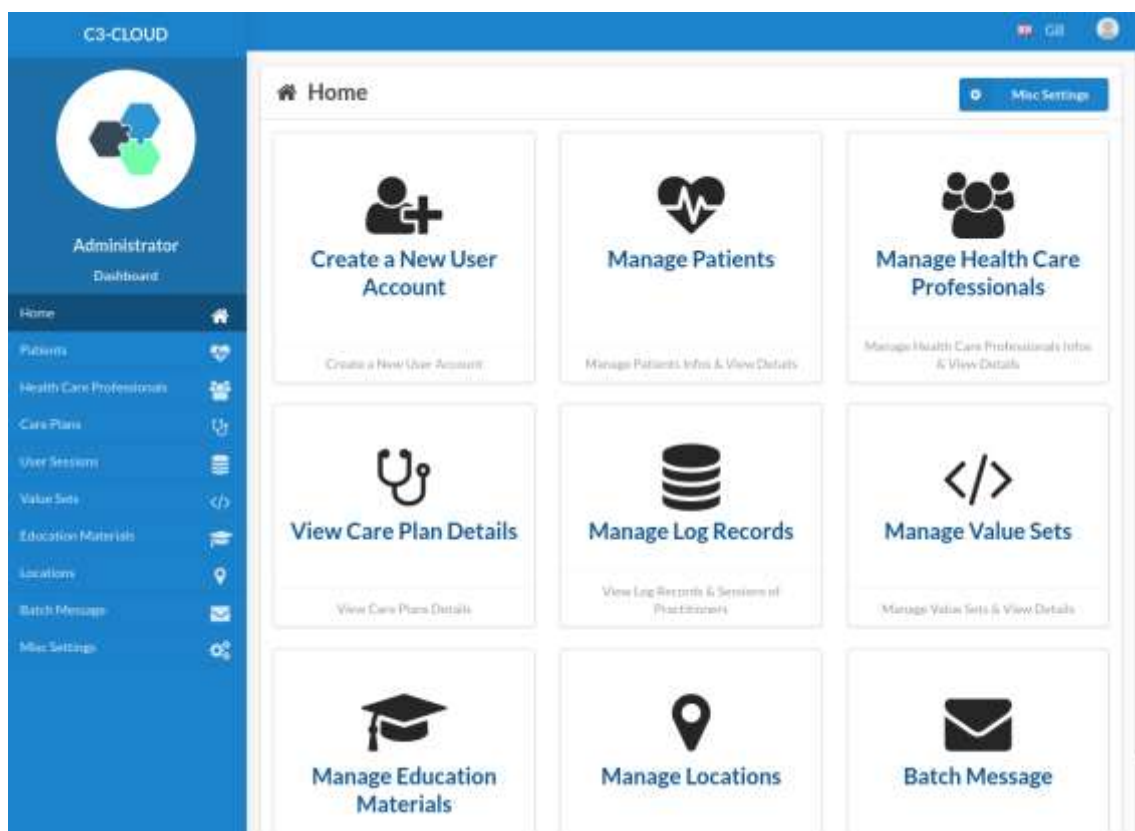


Figure 126 – Administration Dashboard

Creating a User Account

To create a new account (i.e. a username and password) for a health professional or social care worker in the C3-Cloud Identity Provider system, click on the “Create a New User Account” option in the home screen (Figure 126). This option is needed for only those users whose pilot site Identity Provider systems are not integrated with C3-Cloud. These are: all professional users in SWFT; only social care workers in OSAKIDETZA and RJH.

When the button is clicked, the SPS Manager will be opened in a new tab/window. If you are not logged in to the SPS Manager already (i.e. doesn’t have an active session), you will be redirected to the login page as described in the Section 0. Follow the same steps to log in. Then, a user registration form will be displayed as shown in Figure 127.

There are two main options to create a new professional account: Invite User and Register User. The only difference between the two is that, ‘Register User’ asks for a password at the creation phase, which then needs to be changed by the user at first login, while in ‘Invite User’ all data except password is provided and then the user is invited via an email to create their own password in the system. By default, “Create a New User Account” button in C3DP opens the ‘Register User’ option.

The screenshot shows the C3-Cloud web interface. On the left, a sidebar contains navigation links: Dashboard, Access Policy, Access Logs, Manage Clients, Register Users, Invite User, and Register User. The 'Register User' link is highlighted with a red rectangular box. The main area displays the 'User Registration' form. The form includes the following fields: User ID (with a hint 'Enter User ID'), C3-Cloud Study ID (with a hint 'Enter C3-Cloud Study ID'), Username (with a hint 'Enter user name'), Password (with a hint 'Enter Password'), First Name (with a hint 'Enter first name'), Last Name (with a hint 'Enter last name'), Middle Name (with a hint 'Enter middle name'), Gender (a dropdown menu currently showing 'Male'), and Role (a list of checkboxes for Practitioner, Assistant Nurse, Nurse, and Social Care Worker).

Figure 127 - User Registration Form

Description of Form Fields:

1. **User ID:** Real business identifier of the professional user.
Note: It is assumed that real identifiers are composed of upper and lower case ASCII letters, numbers, ‘-’ and ‘.’. In a case this assumption does not fit your requirements, please inform the SRDC team.
2. **C3-Cloud Study ID:** The pseudonym of the health professional in the C3-Cloud study.

3. **Username:** Unique username that will be used to log into the system. It shouldn't contain whitespaces and non-ascii characters. (*Recommended username pattern: name_surname*)
4. **Password:** Password of the user (the user will be forced to change it at first login).
5. **First Name, Last Name, Middle Name, Gender:** Personal information of the user.
6. **Role:** User's role in the C3-Cloud application (i.e. Practitioner, Nurse, Social Care Worker, etc.)
7. **E-mail:** E-mail address of the user. In case of 'Invite User', the registration invitation will be sent to this email address.
8. **Phone:** Phone number of the user. It is optional.
9. **Picture:** Url to a picture of the user that will be used as profile picture on the system. It is optional.

Suspending a User Account

To suspend a user's account, go back to the Dashboard of SPS Manager by clicking the "Dashboard" item from the side menu (Figure 127 above). Find the desired user from the list and click on it (Figure 128 below). Then, the user's information will pop up. Click "Suspend" button from below the user information to suspend the account and inactivate the user in C3DP.

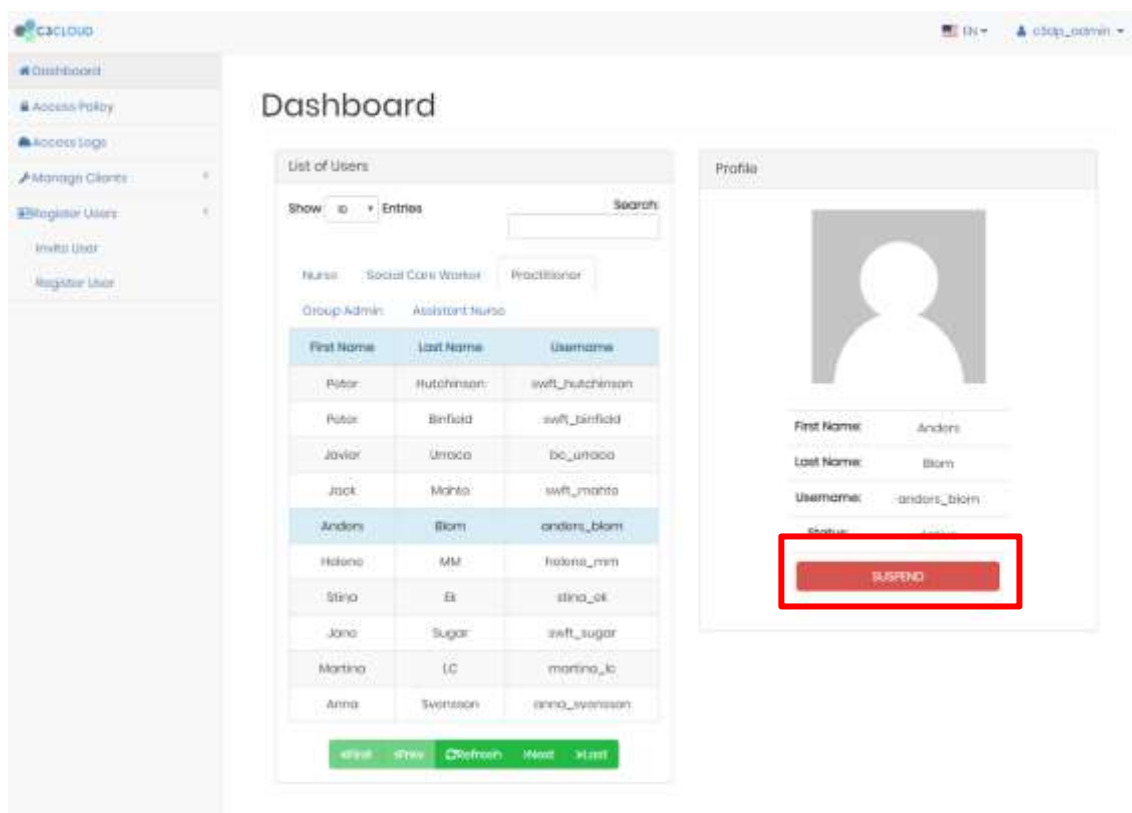


Figure 128 - Suspend User Account

The following sections are describing the other modules of the administration interface and can be accessed by clicking the relevant item from the side menu.

Patients

It is possible to see and manage the patients stored in the system using this module. A table with the list of patients is shown (Figure 129) as the first step. You can see number of total patients and number of patients who have an active care plan from the statistics at the top of the screen. You can search patients with their names or see the list of the patients who have an active care plan by clicking on the relevant statistics (Figure 130). You can also edit a patient's contact information by clicking on the edit button next to the patient (Figure 131). The evaluation layer (layer-4 [all patients], layer-3 [closer follow-up patients], med-device [patients involved in medical device study in RJH only]) assignment of the patient can also be seen and updated here.

In case there is a need to update the C3-Cloud study id (i.e. pseudonym) of a patient during the pilot operation, then this is the place to do it.

C3-CLOUD

Patients

104 ALL PATIENTS

72 PATIENTS HAVING CARE PLAN

● All ● Having Care Plan 10 Search Patient... Refresh

Active	Name	Surname	Age	Id	Study Id	CP	Actions
✓	C3-Cloud	Test Patient	48	c3c-test-patient	105	No	✎
✓	Patient	A0154	48	A0154	11	No	✎
✓	Patient	A0113	48	A0113	10	No	✎
✓	Patient	A0082	48	A0082	9	No	✎
✓	Patient	A0050	48	A0050	8	No	✎
✓	Patient	A0049	48	A0049	7	No	✎
✓	Patient	A0037	48	A0037	6	No	✎
✓	Patient	A0028	48	A0028	5	No	✎

Figure 129 - Manage Patients Page

The screenshot shows the C3-Cloud interface. On the left is a blue sidebar with a logo and navigation menu. The main area is titled 'Patients' and features two summary cards: '104 ALL PATIENTS' and '72 PATIENTS HAVING CARE PLAN'. Below these is a table of patients with filters for 'All' and 'Having Care Plan'. The table lists patient details including Name, Surname, Age, ID, Study ID, and CP status, with an 'Actions' column for each row.

Active	Name	Surname	Age	Id	Study Id	CP	Actions
✓	Patient	A0003	48	A0003	3	Y...	
✓	Patient	A0002	48	A0002	2	Y...	
✓	Patient	A0001	48	A0001	1	Y...	
✓	Test	Patient9	85			Y...	
✓	Test	Patient8	85			Y...	
✓	Test	Patient7	85			Y...	
✓	Test	Patient6	85			Y...	
✓	Test	Patient5	85			Y...	

Figure 130 - Patients Who Have an Active Care Plan

The screenshot shows the 'Edit Patient' form for Selena Walker. The form includes a profile picture placeholder and various input fields for patient information. A green 'Active' status indicator is visible in the top right corner. The form is titled 'Selena Walker's Informations'.

Selena Walker's Informations ✓ Active

Name:
 Surname:
 Id:
 Study Id:
 Layer: Layer-4 Layer-3 mad-device
 Birthdate:
 Phone:
 E-mail:
 Address:
 Country:

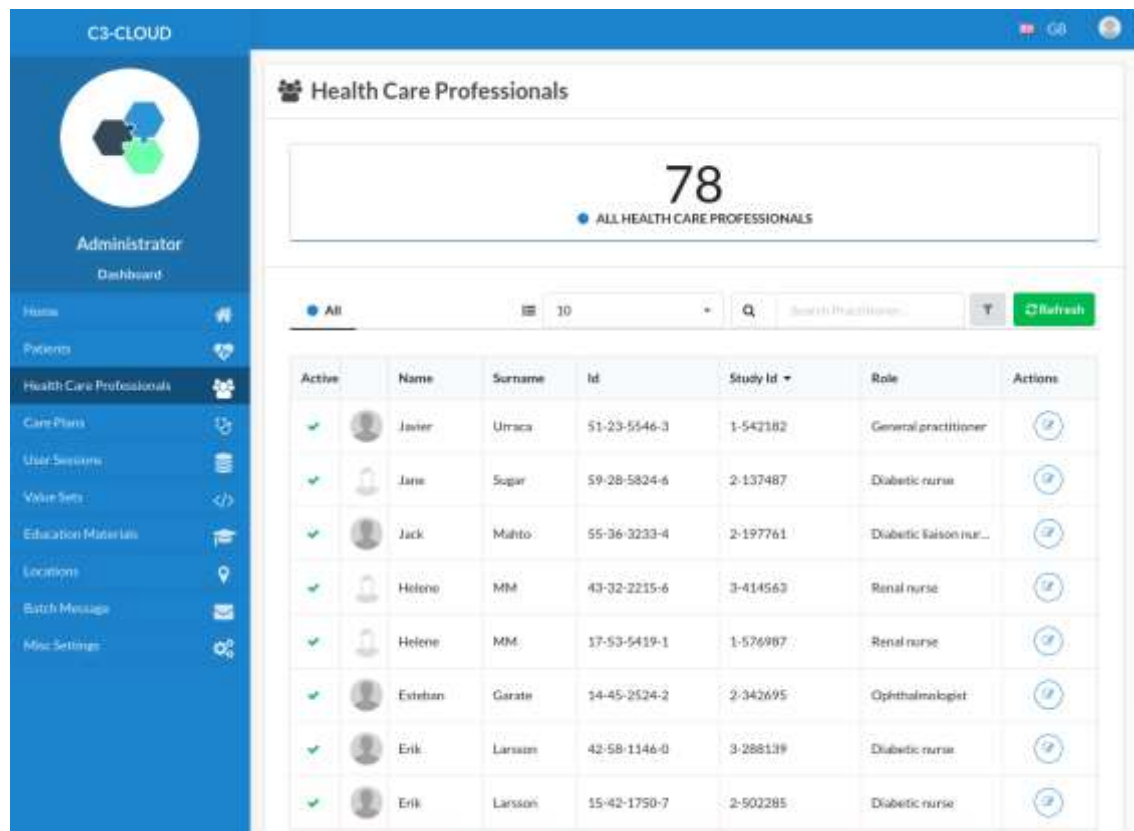
Cancel Save

Figure 131 - Edit Patient

Professionals

Using this module, you can see and manage the demographics of health professionals and social care workers registered in the system. You can search among the professionals and edit their information like changing contact information or qualification (Figure 133).


In case there is a need to update the C3-Cloud study id (i.e. pseudonym) of a professional during the pilot operation, then this is the place to do it. It will especially be necessary for professionals whose user accounts are not created via C3-Cloud Identity Provider.



Active	Name	Surname	Id	Study Id	Role	Actions
✓	Javier	Urraca	51-23-5546-3	1-542182	General practitioner	[Edit]
✓	Jane	Sugar	59-28-5824-6	2-137487	Diabetic nurse	[Edit]
✓	Jack	Mahto	55-36-3233-4	2-197761	Diabetic liaison nur...	[Edit]
✓	Helene	MM	43-32-2215-6	3-414563	Renal nurse	[Edit]
✓	Helene	MM	17-53-5419-1	1-576987	Renal nurse	[Edit]
✓	Esteban	Garate	14-45-2524-2	2-342695	Ophthalmologist	[Edit]
✓	Erik	Larsson	42-58-1146-0	3-288139	Diabetic nurse	[Edit]
✓	Erik	Larsson	15-42-1750-7	2-502285	Diabetic nurse	[Edit]

Figure 132 - Professional

Anna Svensson's Informations Active



Name:

Surname:

Id:

Study Id:

Phone:

E-mail:

Qualification: Delete

New Qualification:

Address:

Cancel Save

Figure 133 - Edit Information of a Professional

Care Plans

To list the existing and closed care plans in the system, click “Care Plans” item from the side menu. You can see the statistics of all, active and inactive care plans, and relevant list of care plans based on the selected statistics (Figure 134).

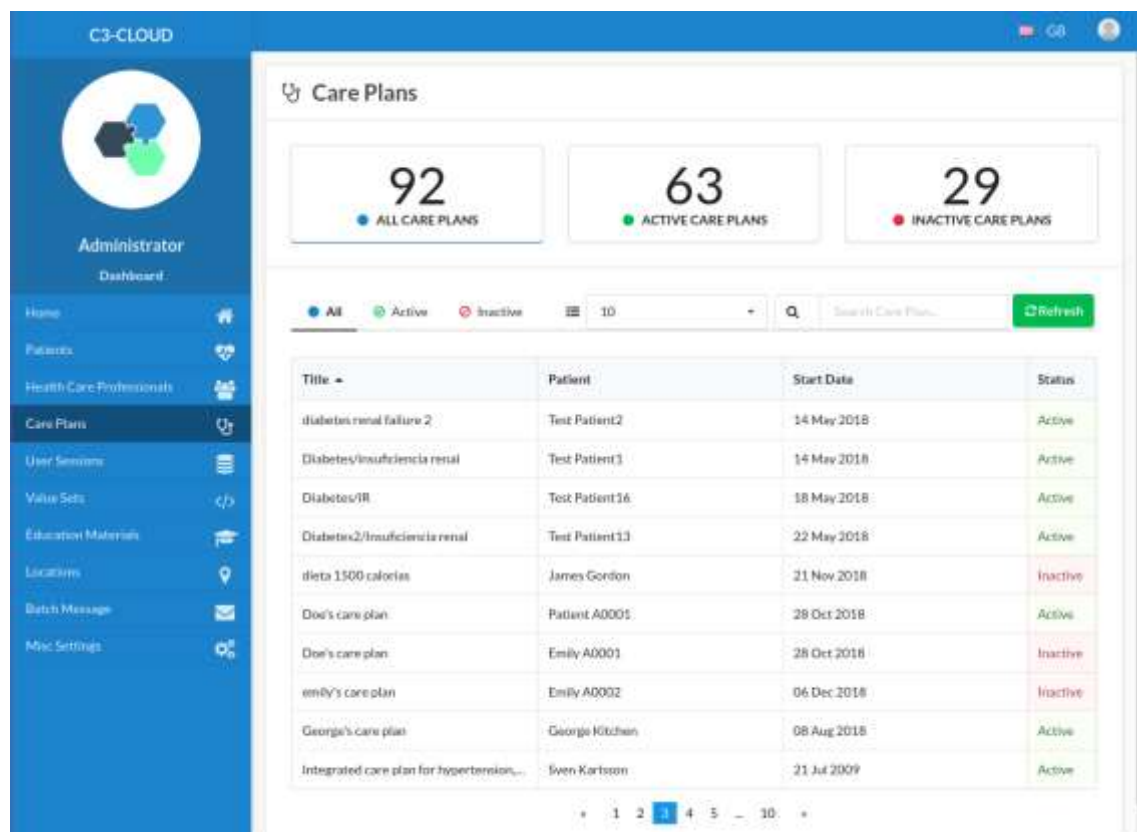
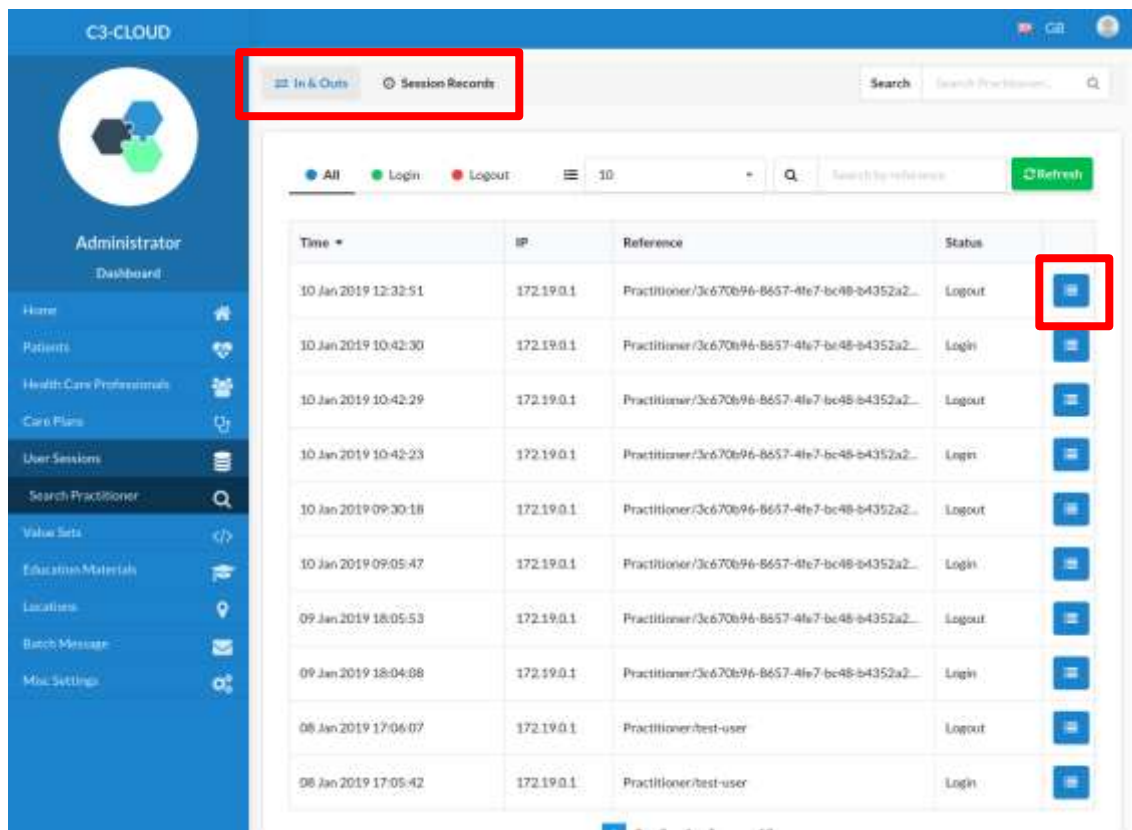


Figure 134 - Care Plans

User Sessions

This module shows the session informations of the users (i.e. login/logout, active session time, session periods). When you navigate to this page, you will see a list of records indicating the login/logout time, IP and a reference to the actor of the event.



C3-CLOUD

Administrator
Dashboard

Home Patients Health Care Professionals Care Plans User Sessions Search Practitioner Value Sets Education Materials Locations Batch Message Misc Settings

In & Out Session Records

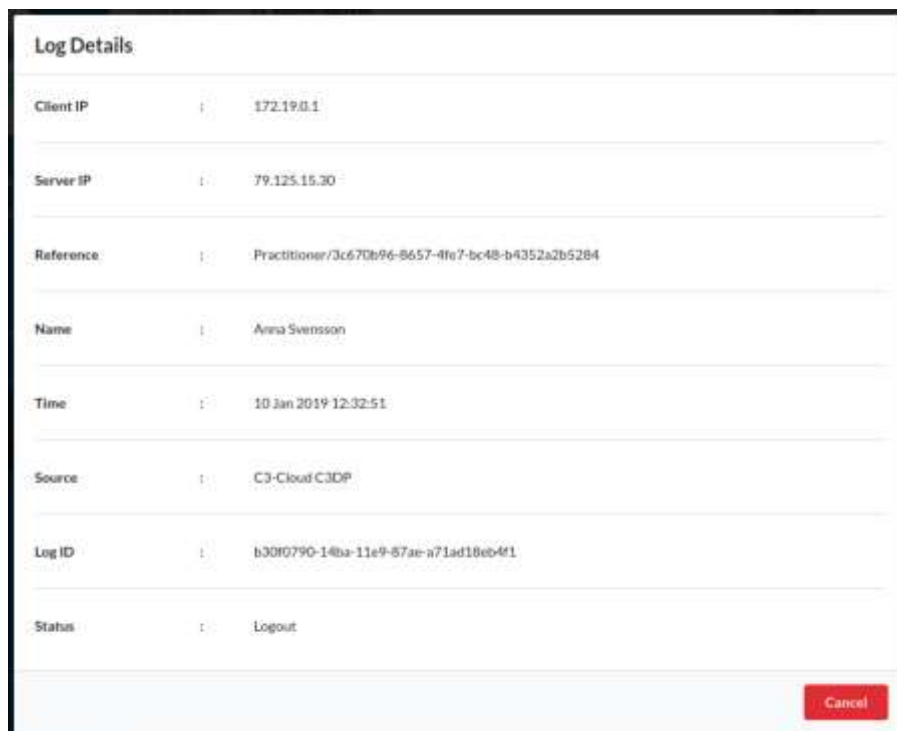
Search Search Practitioner...

All Login Logout 10 Search by refid name Refresh

Time	IP	Reference	Status	
10 Jan 2019 12:32:51	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Logout	
10 Jan 2019 10:42:30	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Login	
10 Jan 2019 10:42:29	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Logout	
10 Jan 2019 10:42:23	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Login	
10 Jan 2019 09:30:18	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Logout	
10 Jan 2019 09:05:47	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Login	
09 Jan 2019 18:05:53	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Logout	
09 Jan 2019 18:04:08	172.19.0.1	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2...	Login	
08 Jan 2019 17:06:07	172.19.0.1	Practitioner/test-user	Logout	
08 Jan 2019 17:05:42	172.19.0.1	Practitioner/test-user	Login	

Figure 135 - Login/Logout Records

You can see the details of the login/logout event by clicking the details button at the end of the record's row.



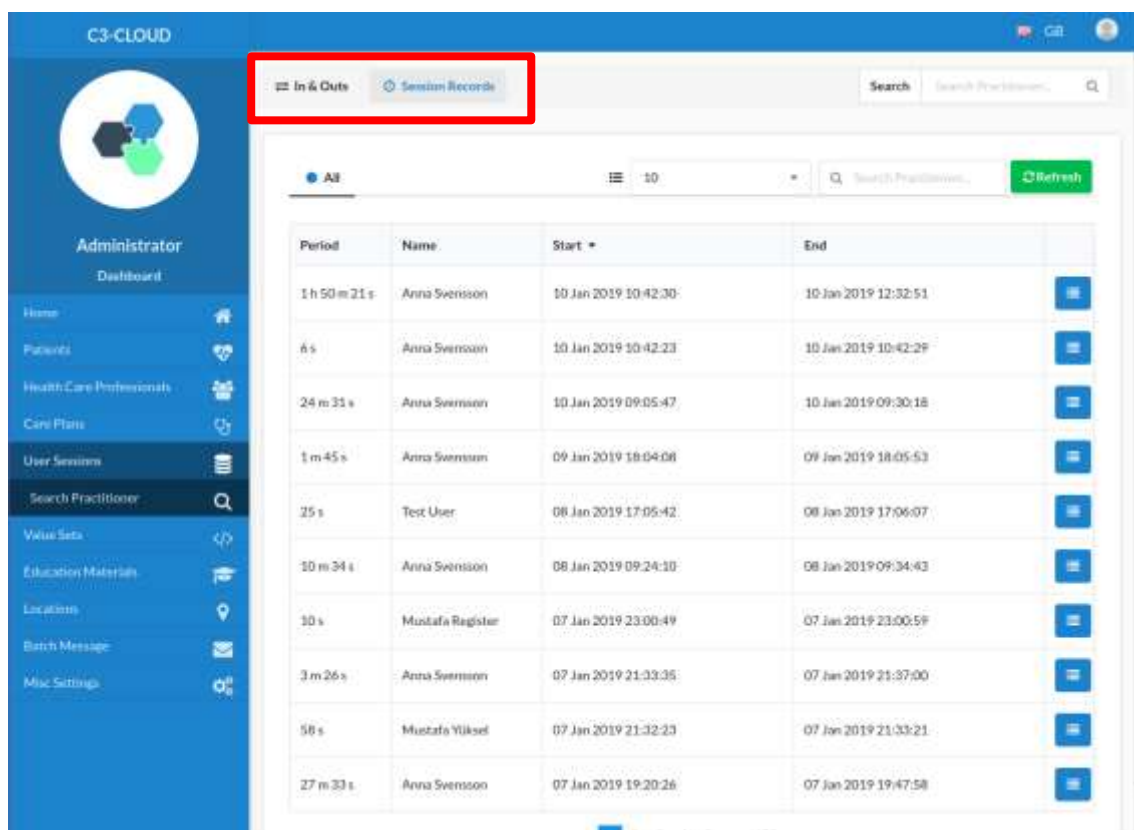
Log Details

Client IP	172.19.0.1
Server IP	79.125.15.30
Reference	Practitioner/3c670b96-8657-4fe7-bc48-b4352a2b5284
Name	Anna Svensson
Time	10 Jan 2019 12:32:51
Source	C3-Cloud C3DP
Log ID	b30f0790-14ba-11e9-87ae-a71ad18eb4f1
Status	Logout

[Cancel](#)

Figure 136 - Record Details

By switching the “Session Records” tab, you can see which user was active when and how long it took for each session.



C3-CLOUD

Administrator Dashboard

Session Records

Search Search Practitioner

● All 10 Search Practitioner Refresh

Period	Name	Start *	End
1 h 50 m 21 s	Anna Svensson	10 Jan 2019 10:42:30	10 Jan 2019 12:32:51
6 s	Anna Svensson	10 Jan 2019 10:42:23	10 Jan 2019 10:42:29
24 m 31 s	Anna Svensson	10 Jan 2019 09:05:47	10 Jan 2019 09:30:18
1 m 45 s	Anna Svensson	09 Jan 2019 18:04:08	09 Jan 2019 18:05:53
25 s	Test User	08 Jan 2019 17:05:42	08 Jan 2019 17:06:07
10 m 34 s	Anna Svensson	08 Jan 2019 09:24:10	08 Jan 2019 09:34:43
10 s	Mustafa Register	07 Jan 2019 23:00:49	07 Jan 2019 23:00:59
3 m 26 s	Anna Svensson	07 Jan 2019 21:33:35	07 Jan 2019 21:37:00
56 s	Mustafa Yüksel	07 Jan 2019 21:32:23	07 Jan 2019 21:33:21
27 m 33 s	Anna Svensson	07 Jan 2019 19:20:26	07 Jan 2019 19:47:58

Figure 137 - Session Records

You can also search for a professional to see only that user's session logs. Type the name in the search box and click on the user that you're searching for.

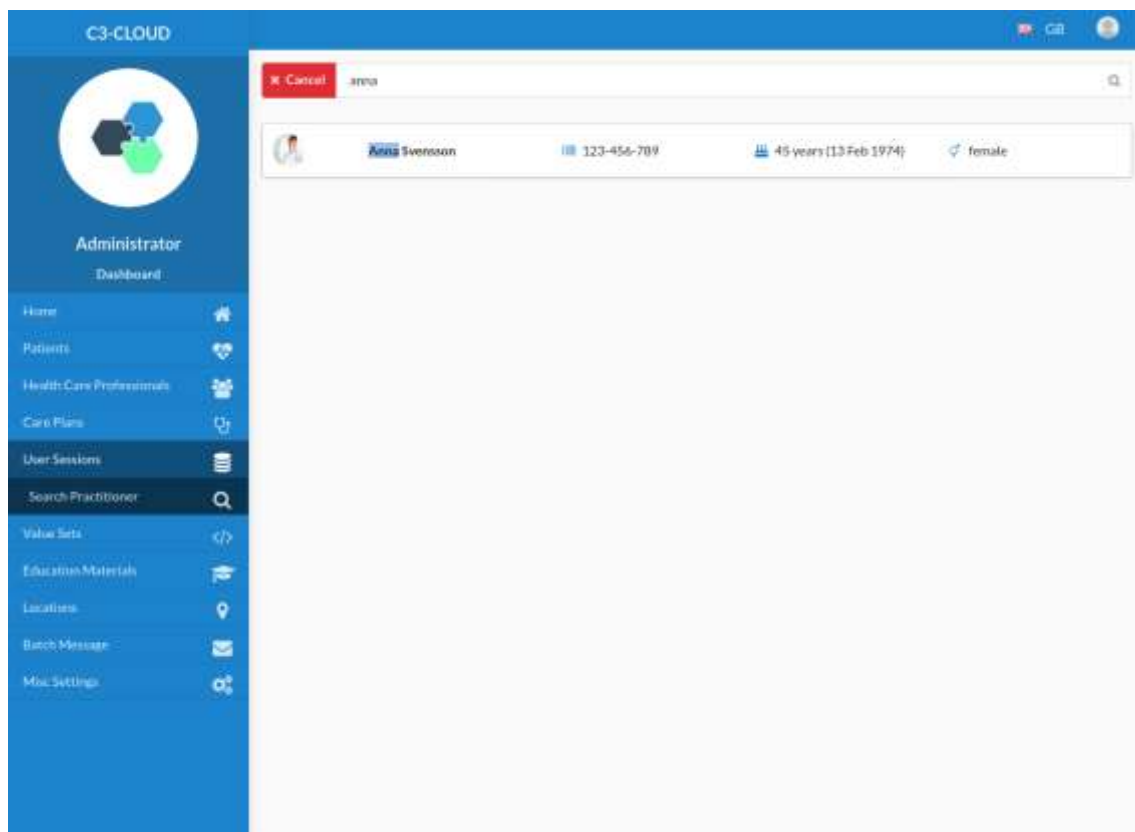


Figure 138 - Search User

Then, the selected user's sessions will be listed. by clicking the segment that is marked with a red box in Figure 139, you can view the user's information and the last active date (Figure 140). Furthermore, you can see the user's session times over days/months as a chart by switching to the "Session Statistics" tab (Figure 141).

The screenshot shows the C3-Cloud interface with a sidebar on the left containing navigation links: Home, Patients, Health Care Professionals, Care Plans, User Sessions, Search Practitioner, Value Sets, Education Materials, Locations, Batch Message, and Misc Settings. The main content area displays a table of sessions for Anna Svensson. A red box highlights the header 'Anna Svensson's Informations'.

Period	Name	Start	End
1 h 50 m 21 s	Anna Svensson	10 Jan 2019 10:42:30	10 Jan 2019 12:32:51
6 s	Anna Svensson	10 Jan 2019 10:42:23	10 Jan 2019 10:42:29
24 m 31 s	Anna Svensson	10 Jan 2019 09:05:47	10 Jan 2019 09:30:18
1 m 45 s	Anna Svensson	09 Jan 2019 18:04:08	09 Jan 2019 18:05:53
10 m 34 s	Anna Svensson	08 Jan 2019 09:24:10	08 Jan 2019 09:34:43

Figure 139 - Selected User's Logs

The screenshot shows the C3-Cloud interface with a sidebar on the left containing navigation links: Home, Patients, Health Care Professionals, Care Plans, User Sessions, Search Practitioner, Value Sets, Education Materials, Locations, Batch Message, and Misc Settings. The main content area displays user information for Anna Svensson, including a profile picture and a table of sessions.

Anna Svensson's Informations

Name	Anna Svensson
Id	123-456-789
Study Id	3-00002
Role	General physician
Last Active Date	10 Jan 2019 12:32:51

Period	Name	Start	End
1 h 50 m 21 s	Anna Svensson	10 Jan 2019 10:42:30	10 Jan 2019 12:32:51
6 s	Anna Svensson	10 Jan 2019 10:42:23	10 Jan 2019 10:42:29

Figure 140 - User Information

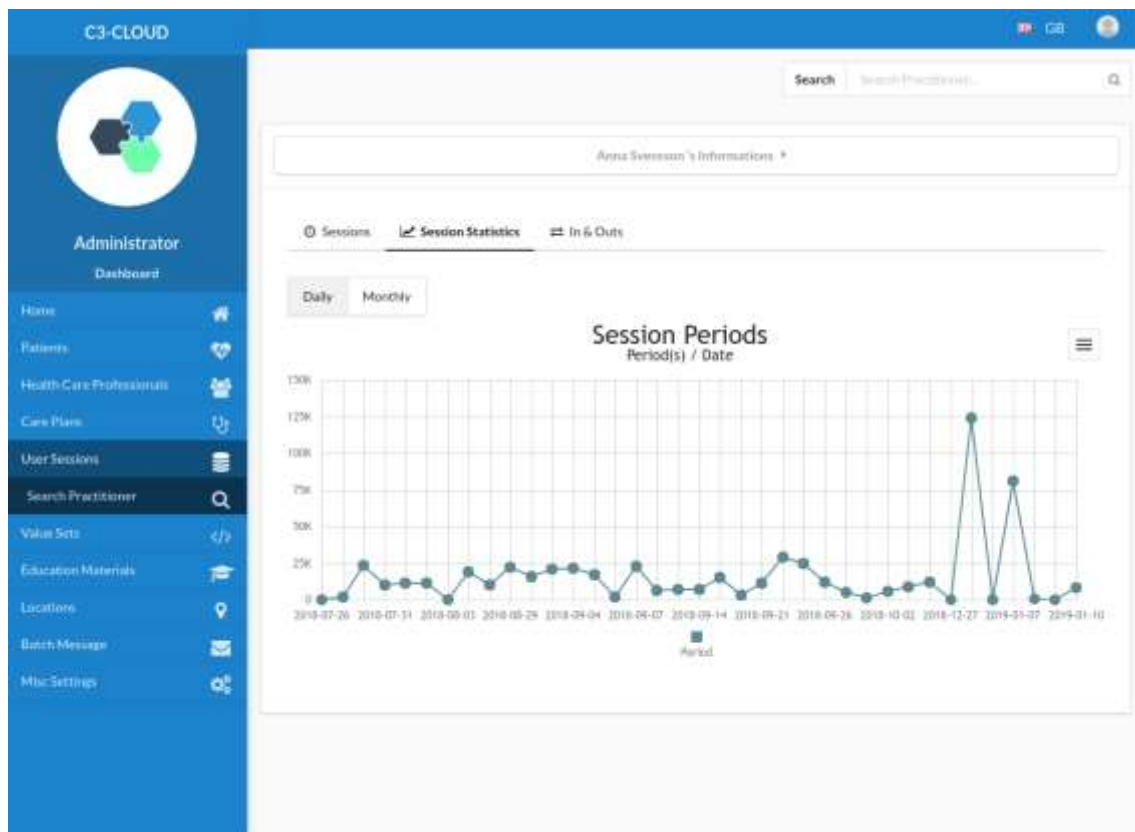


Figure 141 - Session Durations over Time

Value Sets

Several value sets containing coded terms are used in the C3-Cloud system while assigning goals, activities, etc. In this module, it is possible to manage the content of such value sets by either updating existing codes or adding new ones (e.g. defining a new patient order code like 'hiking') (Figure 142). All the value sets that can be managed are listed at the top as a row. Please select first the value set that you want to manage.

C3-CLOUD

Administrator Dashboard

- Home
- Patients
- Health Care Professionals
- Care Plans
- User Sessions
- Value Sets**
- Education Materials
- Locations
- Batch Message
- Misc Settings

</> Value Sets

Appointment Type Codes | Diet Codes | General Activity Codes | Goal Code | Lab Test Codes | Medication Route Codes | Patient Order Codes | Role Codes

Appointment Type Codes [+ Add New Code](#)

Total Appointment Type Codes : 5

Search Code/Display

System	Code	Display	Actions
http://hl7.org/fhir/v2/0276	CHECKUP	Check-up	[F] [X]
http://hl7.org/fhir/v2/0276	EMERGENCY	Emergency	[F] [X]
http://hl7.org/fhir/v2/0276	FOLLOWUP	Follow-up	[F] [X]
http://hl7.org/fhir/v2/0276	ROUTINE	Routine	[F] [X]
http://hl7.org/fhir/v2/0276	WALKIN	Walk-in	[F] [X]

Figure 142 - Manage Value Sets

While adding a new coded term, you will see that the default language of the site is highlighted with red borders. It is mandatory to provide this default language value while the other languages are optional (Figure 143).

Add New Coding Concept

Don't leave any free spaces!

System:

Code:

Display:

EN:

ES:

SV:

Cancel Save

Figure 143 - Add New Code Mapping

Education Materials

This module allows managing all the education materials in the system (Figure 144). You can filter them using the search box and edit or delete the materials. You can also add a new material using the “Add New Material” button. While adding or editing a material (Figure 145), you will be asked for:

- **URL:** Link to the online material
- **Title:** Title of the material
- **Language:** Which language this material is written in
- **Reasons:** The related conditions/diseases addressed in the material. This is optional and can only be selected among C3-Cloud major diseases.

All the education materials that have been provided earlier by each pilot site have already been imported into the C3-Cloud system. This module will only be needed in case there is a need to update a link of an existing material or define a new one that is commonly preferred by the professionals.

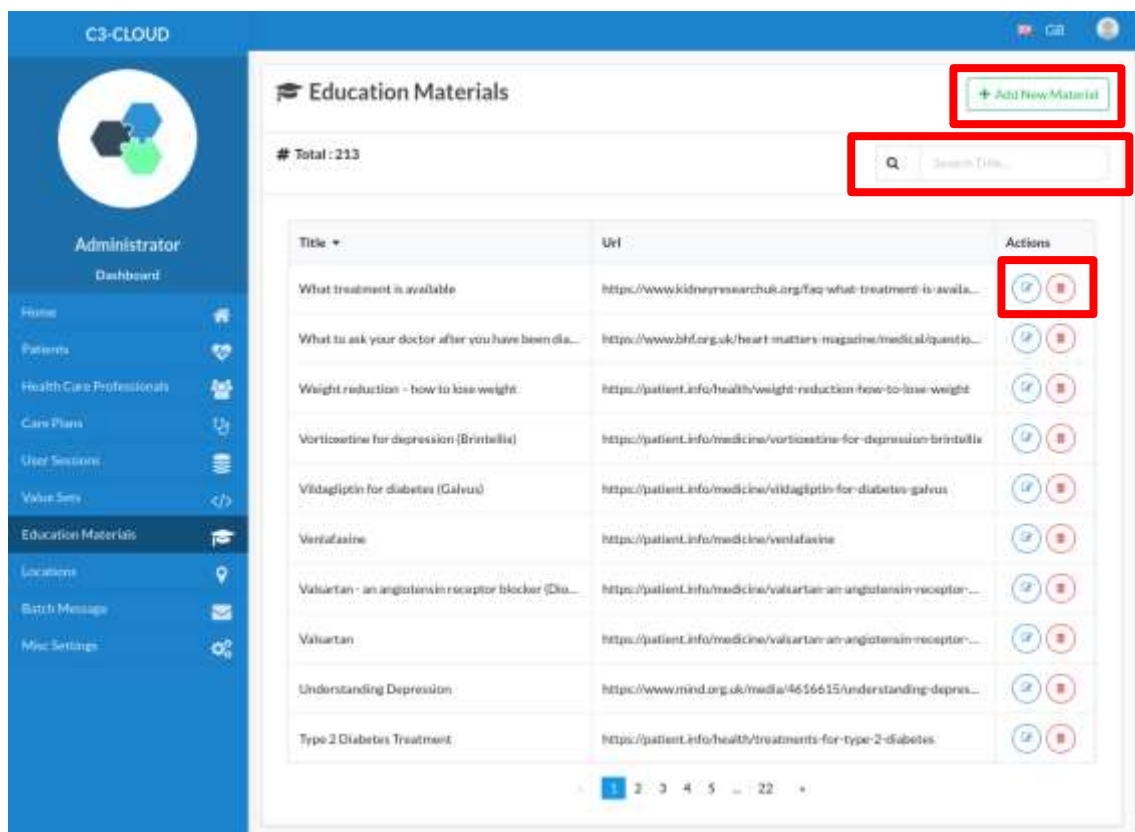


Figure 144 - Education Materials

The screenshot shows the 'Add New Education Material' form. The form has four main fields: URL, Title, Language, and Reason(s). Each field has a placeholder text. The URL field has a placeholder 'http'. The Title field has a placeholder 'Title'. The Language field has a placeholder 'Select language'. The Reason(s) field has a placeholder 'Search'. At the bottom right, there are 'Cancel' and 'Save' buttons. A red box highlights the 'Add New Material' button in the top right corner.

Figure 145 - Add New Education Material

Locations

This page shows the saved locations to be used in the system like hospitals, clinics, laboratories, etc. (Figure 146) You can add new locations or modify/delete the existing ones (Figure 147).

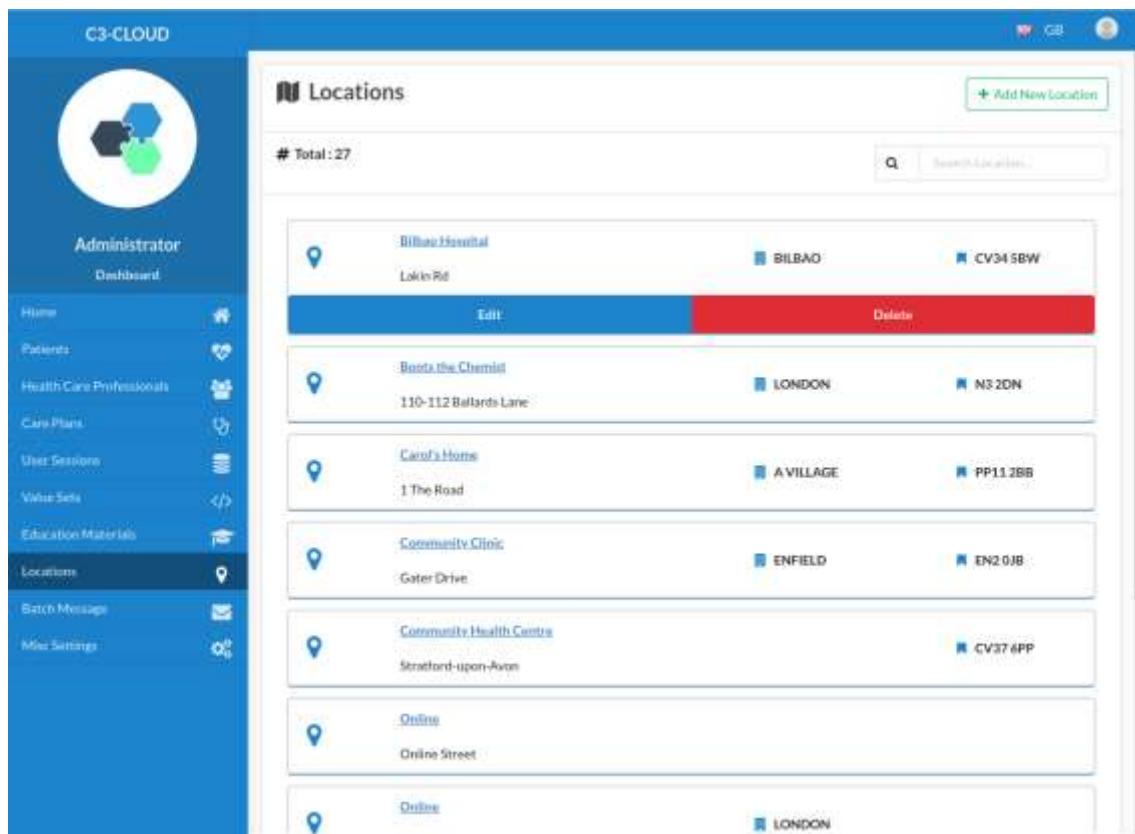


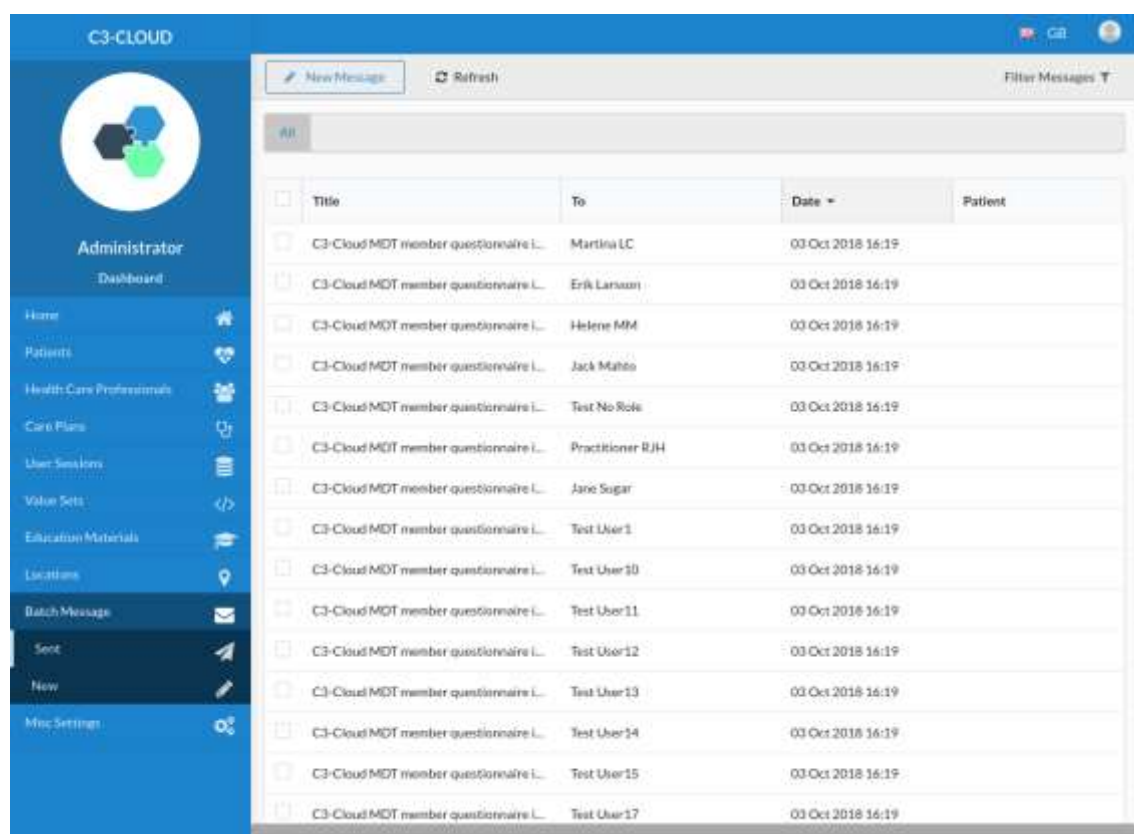
Figure 146 - Locations

The screenshot shows the 'Edit Location' form. The form fields and their values are: Name: Bilbao Hospital, Address: (empty), Use: work, Type: Select Type, Line: Lekin Rd, Country: ES, State: (empty), City: Bilbao, and Postal Code: CV34 5BW. The form has 'Cancel' and 'Save' buttons at the bottom right.

Figure 147 - Edit Location

Batch Message

This module can be used to send administrative messages to the users. You can list and display the previously sent batch messages (Figure 148).



The screenshot shows the C3-Cloud interface with a blue sidebar on the left and a main content area. The sidebar includes a logo, the role 'Administrator', and a 'Dashboard' link. Below these are several menu items: Home, Patients, Health Care Professionals, Care Plans, User Sessions, Value Sets, Education Materials, Locations, Batch Message (highlighted), Sent, New, and Misc Settings. The main content area has a header with 'New Message', 'Refresh', and 'Filter Messages'. Below this is a table of previously sent batch messages.

<input type="checkbox"/>	Title	To	Date	Patient
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Martina LC	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Erik Larsson	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Helene MM	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Jack Mahto	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test No Role	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Practitioner RJH	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Jane Sugar	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User1	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User10	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User11	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User12	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User13	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User14	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User15	03 Oct 2018 16:19	
<input type="checkbox"/>	C3-Cloud MDT member questionnaire L...	Test User17	03 Oct 2018 16:19	

Figure 148 - Previously Sent Batch Messages

You can also send a new batch message to all or a specific part of the users by clicking the ‘New’ sub-menu from the left bar (Figure 149). It is possible to send batch messages to all professional users; layer-4 patients (all); layer-3 patients (closer follow-up); or med-device patients (patients involved in medical device study in RJH only). This function is to be used mainly for sending evaluation questionnaire fulfillment invitations to both professionals and patients.

C3-CLOUD

Administrator
Dashboard

- Home
- Patients
- Health Care Professionals
- Care Plans
- User Sessions
- Value Sets
- Education Materials
- Locations
- Batch Message**
- Sent
- New
- Misc Settings

New Batch Message

To: Health Care Professionals All Patients

Health Care Professionals:

- ☒ All

Patients:

- ☒ Layer-4 (All)
- ☒ Layer-3
- ☒ Med-device

Title

Title:

Message:

Send

Figure 149 - New Batch Message

Misc Settings

This page has a single button to trigger updating of the transcoding and translations of clinical concepts that are required by the CDS services by calling the SIS Terminology Mapping Service (Figure 150).

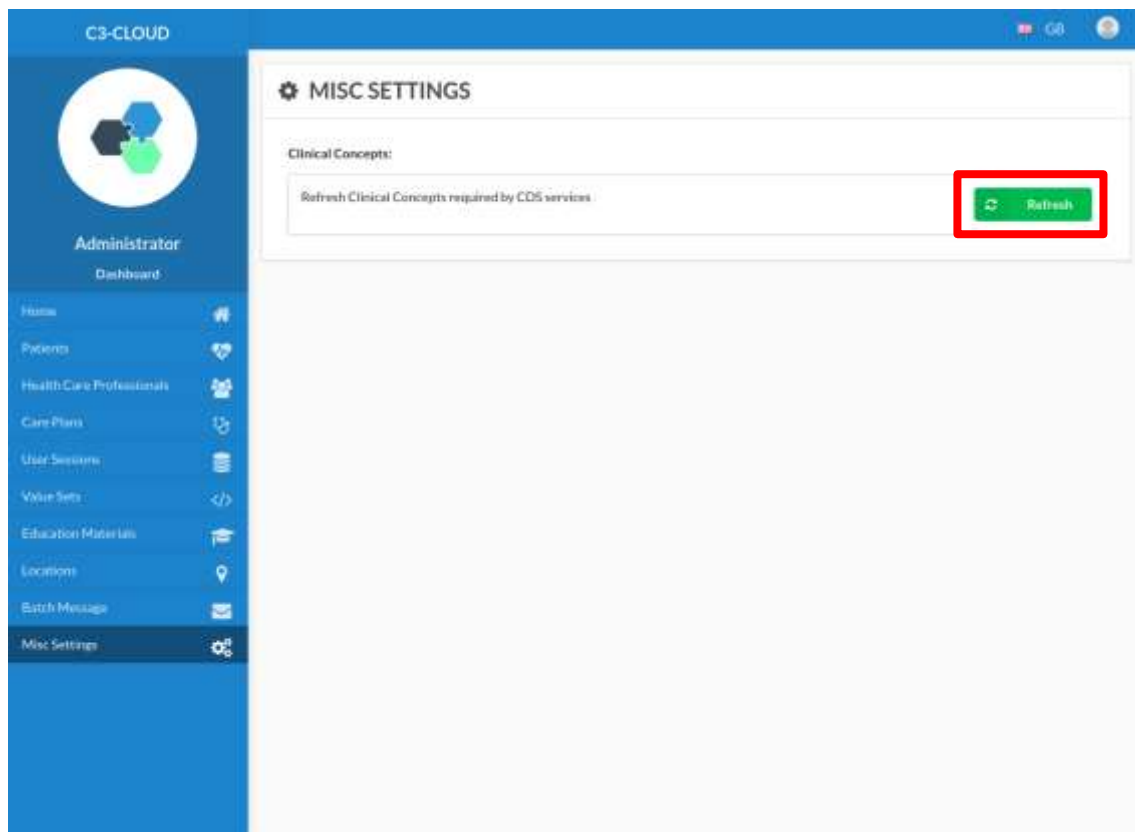


Figure 150- Misc Settings

Appendix 13 - C3-Cloud Patient Empowerment Platform (PEP) Technical User Manual

1. DESCRIPTION OF THE INFORMATION SYSTEM

List of applications

- Web application
 - o Name: [Web Application Name]
 - o Run in Microsoft IIS
- Database
 - o Name: [SQL Database Name]
 - o Microsoft SQL Server

2. OPERATION

Starting and stopping the service

The service is best managed through its Application Pools (<https://blogs.msdn.microsoft.com/rohithrajan/2017/10/08/quick-reference-iis-application-pool/>).

Application pools can be stopped and started. Application pool should be set to recycle every night in IIS application pool settings, e.g. 3:00. In case the application exhibits unwanted behavior, it can be recycled manually from application pool settings. Unnecessary recycling should be avoided during operating hours as application start up causes a delay for imminent requests but recycling does not cause any other unwanted consequences like session expiration so it can be performed at any time as the first attempt to restore application functionality.

Batch processes

The application doesn't use any scheduled processes.

Monitoring

The web application run in IIS can be monitored using many different tools and settings. A good explanation of different ways to perform monitoring can be read from here: <https://blog.serverdensity.com/monitor-iis/>

Medixine's applications can be set to notify about unexpected situations to a file log, via email, or directly to Windows event log (on by default). If you are interested in these notifications, please ask Medixine about the configuration.

3. RESOLUTION INCIDENTS

General platform problems

If the PEP application stops working, the first and easiest resolution option is to recycle the application pool. If this has to be performed often, Medixine should be notified about the problem so that it can be investigated and properly fixed.

If the problem is not resolved with an app pool recycle, the issue should be escalated to Medixine, support@medixine.com.

Include following information in the support requests:

- **Time.** When the error has been observed? If the situation is continuous, when was the first time the error was observed?
- **User OS/browser.** If the error is related to a single user, include the user's browser type (IE/Firefox/Chrome...), platform (PC/Android/Linux...) and browser version
- **Server log info.** Check the server's event log, Application category for any error reports from Medixine software and include potential errors in the support request.
- **Screenshots.** Any screenshots that help clarify what the issue is.
- **Environment.** Does the issue occur in the staging or production environments. Could the issue be duplicated in staging, if it occurs in production environment.

For issues related in any way with the integration with C3DP, access to relevant FHIR data may help/be needed for investigation of the issue.

4. APPLICATION OPERATIONS

Deployment of new version

Medixine Deployment deliveries contain two parts in their own folders: Database scripts and web application. The delivery also contains release notes that include the version number for the release and changelog.

Installing the Web Application: Replace the web application folder contents with the contents of the new delivery.

Installing database scripts: Run the database scripts against the database, preferably using SQL Server Management Studio.

Uninstall and revert to previous version

Reverting to previous version can be done by replacing the web application folder with the previous delivery unless the new delivery release notes specify that the database scripts are not backwards compatible. In such case, please consult Medixine to acquire scripts to revert the database delivery version.

Appendix 14 - C3-Cloud Technical Interoperability Suite (TIS) Technical User Manual

1. DESCRIPTION OF THE SYSTEM

Definition and objectives

C3-Cloud TIS enables patient data synchronization from local EHR to C3-Cloud. More specifically, TIS imports patient data from local EHR into C3-Cloud FHIR Repository either on demand or at scheduled intervals. This document is aimed for administrative users of C3-Cloud TIS. The document describes the procedures of using TIS for registration of patient id and import of patient data into C3-Cloud. The document also covers configuration and management of the system in an operational environment.

List of applications

TIS is comprised of two components, TIS Web App and TIS MongoDB Database, both of which are deployed as docker containers at each pilot site. Table 2 and Table 3 list the deployed TIS components in staging and production environments respectively.

Table 2 TIS Staging Deployment

Pilot Site	TIS Web App	TIS MongoDB
OSAKI	http://stagingtis.osasunet (official) http://c3cloud01.osasunet:6104 (internal)	c3cloud02.osasunet:6105
RJH	https://c3cloudtest.jll.jllad.se/tis (official) http://RJHvC3CloudTest.jll.jllad.se:6104 (internal)	RJHvC3CloudDbTest.jll.jllad.se:6105
SWFT	http://c3cloud.swft.nhs.uk :6104	svfwhc3appsw10.xswhc.nhs.uk:6105

Table 3 TIS Production Deployment

Pilot Site	TIS Web App	TIS MongoDB
OSAKI		
RJH		
SWFT		

2. USE OF THE SYSTEM

When patients are first recruited, their data need to be synchronized from pilot site EHR systems to C3-Cloud, so that MDT members can use the data to create and monitor care plans. This data synchronization process is driven by TIS. TIS provides a web based user interface to help manage the steps.

1. First sign into TIS using the preconfigured username/password. Configuration of username and password is described in section 0.


 A screenshot of the TIS sign-in interface. It features a light gray background with the text "Please sign in" in a large, bold, dark blue font. Below this text are two input fields: the first is a yellow box containing the text "c3cloud", and the second is a white box with a blue border containing four dots "....". Below these fields is a prominent blue button with the white text "Sign in".

Figure 151 TIS sign in

2. In all pilot sites, patient health data are retrieved from EHR systems by their local identifiers, so patient identifiers need to be registered with TIS in order to initiate data synchronization. Click *Patient* tab and click *Add Patient* button. A *New Patient* window pops up. Input patient id as shown in **Error! Reference source not found.**. Input other information required by the evaluations studies, including C3-Cloud study identifier, patient email address (optional), whether patient falls in the layer 3 or layer 4 evaluation group, and whether the patient uses a medical device during the study.

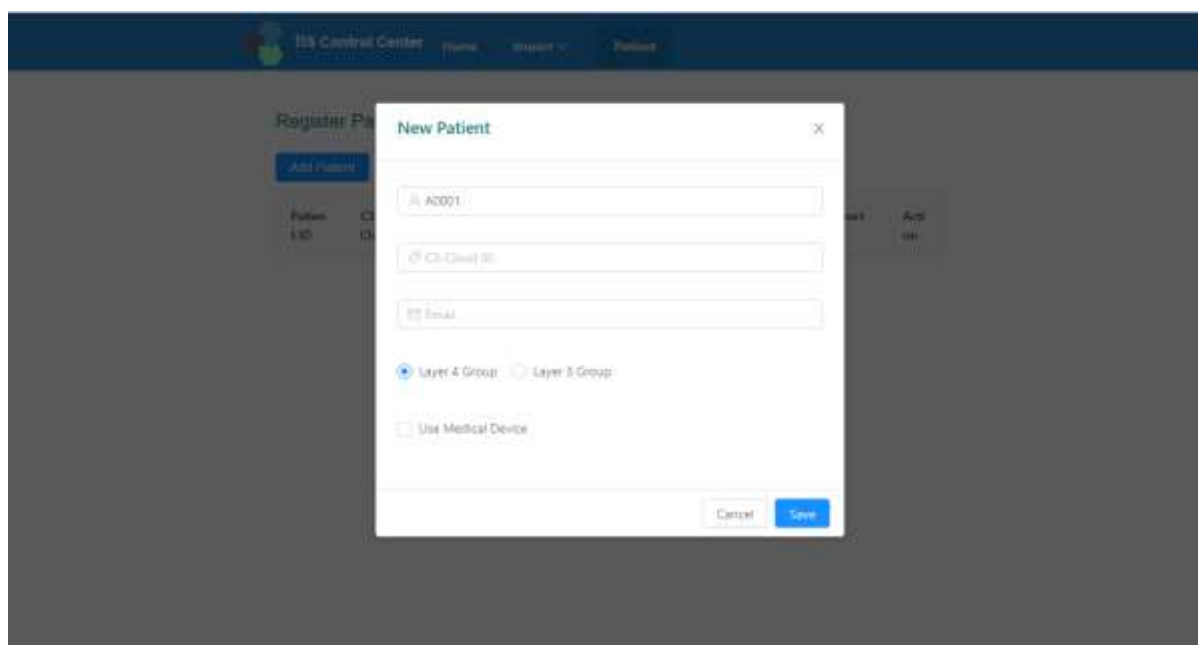

 A screenshot of the "New Patient" registration window within the TIS Central Center application. The window is a white modal box with a close button (X) in the top right corner. It contains several input fields: "Patient ID" with the value "A0001", "C3-Cloud ID", and "Email". Below these fields are two radio button options: "Layer 4 Group" (which is selected) and "Layer 5 Group". At the bottom, there is a checkbox labeled "Use Medical Device" and two buttons, "Cancel" and "Save". The background shows a blurred view of the main application interface with a "Register Patient" section and an "Add Patient" button.

Figure 152 Add new patient

- Click the *Save* button to save the patient. The *Patient* tab lists all registered patients as show in Figure 153.

Patient ID	C3-Cloud ID	Email	Evaluation Group	Use Medical Device	Creation Date	Last Import Time	Action
A0001	1		Layer II	No	2019-02-07		Delete

Figure 153 Patient list

- Once the patient id is added, his/her data can be synchronized from local EHR to C3-Cloud. Click *Import* tab and click *Defined Task*. The page shows the predefined data import tasks (Figure 154). Generally one task per site. There are two options to run a task. *Execute* will run the task immediately. *Schedule* will run the task at specified time and can either run the task once or repeat the task at regular interval.

Name	Status	Date Modified	Description	Action
ICD-10-CM-ICD-9-CM-ICD-10-PCS-Import	S	2019-02-07	Import data by patient id from ICD-10-CM-ICD-9-CM-ICD-10-PCS repository	Execute Schedule
ICD-10-CM-ICD-9-CM-ICD-10-PCS-Import	S	2019-02-07	Import data by patient id from ICD-10-CM-ICD-9-CM-ICD-10-PCS repository	Execute Schedule
GP, HMO, and Community Import	S	2019-02-07	Import data from GP, HMO, and Community repository into C3-Cloud repository	Execute Schedule

Figure 154 Data import tasks

- Figure 155 shows an example of *Schedule Task*. For this particular task, a number of task parameters need to be specified, such as file URIs and patient identifiers. *Patient* is a common parameter in all three tasks, for which a single patient id, a list of patient ids, or all patients could be specified. Figure 156 shows an example of a list of patients. In addition to the task specific parameters, 3 scheduling parameters can be added, including *Start time*, *Repeat* and *Until*. *Start time* decides when the task starts running. *Repeat* specifies how often the task repeats, such as *None* (no repeat), or Every hour, day, week or month. *Until* decides when the task ends, which can be either manually stopped or at a specific time.

The screenshot shows the 'Schedule Task' interface in the TIS Control Center. The header bar is blue with the 'TIS Control Center' logo and navigation links for 'Home', 'Import', and 'Patient'. The main content area is white and contains the following fields:

- Schedule Task**: A title for the task.
- GP_EMIS/Lorenzo_Community-import v1**: The task name.
- * GP_EMIS_file_uri**: A text input field containing 'file:///C:/c3cloud/test/GP_EMIS.csv'.
- * Lorenzo_Community_file_uri**: A text input field containing 'file:///C:/c3cloud/test/Lorenzo_Community.csv'.
- * patient**: A section with two radio buttons: 'Input patient ID' (selected) and 'Select all patients'. Below is a text input field containing 'A0001'.
- * Start time**: A date and time picker showing '2019-02-17 02:00'.
- Repeat**: A dropdown menu set to 'Every week'.
- Until**: A section with two radio buttons: 'Manually stopped' (selected) and 'End time'.
- Submit** and **Cancel** buttons at the bottom.

Figure 155 Schedule a task

TIS Control Center Home Import Patient

Schedule Task

GP_EMIS/Lorenzo_Community-Import v1

+ GP_EMIS_file_uri
file:///C:/c3cloud/test/GP_EMIS.csv

+ Lorenzo/Community_file_uri
file:///C:/c3cloud/test/Lorenzo_Community.csv

+ patient
☒ Input patient ID ☐ Select all patients
A0001, A0002, A0003

+ Start time
2019-02-17 02:00

Repeat
Every week

Until
☒ Manually stopped
☐ End time

Submit Cancel

Figure 156 Schedule a task with patient list

6. Click *Submit* to submit the task. The scheduled task will show up in the scheduled task list (Figure 157). This list can also be viewed by click *Import* tab and select *Scheduled Task*. Each entry in the list shows the total number of executions and the most recent execution time of the scheduled task. Each task can be stopped or deleted.

TIS Control Center Home Import Patient

Scheduled Import Task

Task	Parameters	State	Created	Start	Repeat	Until	Number of Executions	Last Execution
GP_EMIS/Lorenzo_Community-Import v1	{ "GP_EMIS_file_uri": "file:///C:/c3cloud/test/GP_EMIS.csv", "Lorenzo/Community_file_uri": "file:///C:/c3cloud/test/Lorenzo_Community.csv", "patient": "A0001", "A0002", "A0003" }	Active	2019-02-17 15:47	2019-02-17 19:00	Every week		0	

Stop Delete

Figure 157 Scheduled task

7. The execution log of a scheduled task or executed task (by click *Execute*) can be viewed at the *Task Execution Log* page. This page can be reached by click *Import* tab and select *Execution Log*. The state is *Success* if the task is executed without error. Otherwise, the details of the error are shown in *Details*.

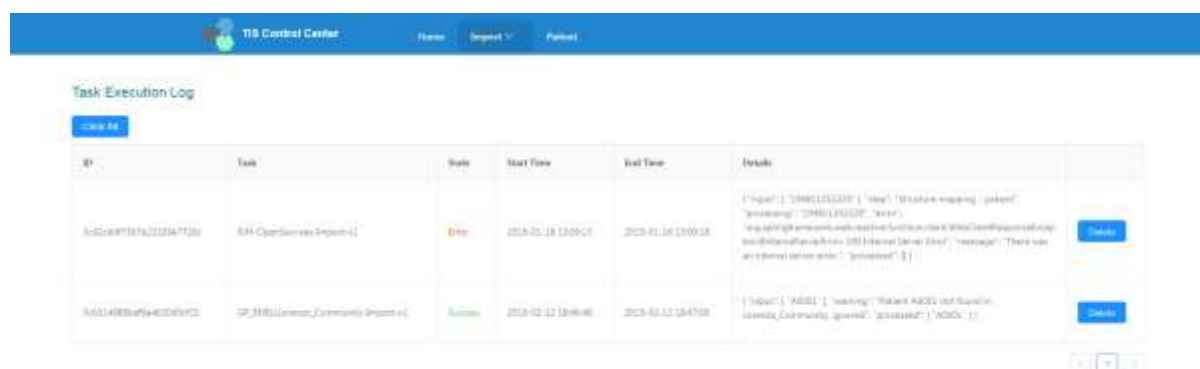


Figure 158 Task execution log

3. CONFIGURATION

The TIS Web App has a configuration file `application.yml` which can be used to customize username/password and email notifications. The location of the file is listed in Table 4 for both staging and production:

Table 4 Configuration file application.yml location in staging

Pilot Site	Staging	Production
OSAKI	/c3cloud/staging/tis	
RJH	/srv/c3cloud/tis	
SWFT	D:\EMISFTP	

Username/Password

Change username and password in application.yml:

```
spring:
  security:
    user:
      name:
      password:
```

Email

TIS can send error notification by email if a data import task fails. The send and recipient email addresses can be customized in `application.yml`:

email:

notification:	(true/false to enable or disable the notification)
from:	(sender's email address)
to:	(recipient's email address)

4. OPERATIONS

TIS is delivered and deployed as docker containers, so the operations follow the standard docker administration procedure.

Start

- OSAKI

Staging

```
#TIS MongoDB
ssh c3cloud02.osasunet
cd /c3cloud/staging/tis-mongo

docker run -d --name=c3cloud_test_tismongodb --restart unless-stopped -v
$(pwd)/data:/data/db -p 6105:27017 c3cloud01.osasunet:5000/mongo:4.0

#TIS Web App
ssh c3cloud01.osasunet
cd /c3cloud/staging

docker run -d --name=c3cloud_test_tis --restart unless-stopped -v
$(pwd)/tis:/tmp -p 6104:80 docker-registry-
c3cloud.osakidetza.eus/c3cloud/tis:1.0
```

Production

- RJH

Staging

```
#TIS MongoDB
ssh RJHvC3CloudDbTest
cd /srv/c3cloud/tis-mongo

docker run -d --name=c3cloud_test_tismongodb --restart unless-stopped -v
$(pwd)/data:/data/db -p 6105:27017 docker-registry-
c3cloud.osakidetza.eus/mongo:4.0

#TIS Web App
ssh RJHvC3CloudTest
cd /srv/c3cloud
```

```
docker run -d --name=c3cloud_test_tis --network=c3cloud_test_default --restart
unless-stopped -v $(pwd)/tis:/tmp -p 6104:80 docker-registry-
c3cloud.osakidetza.eus/c3cloud/tis:1.0
```

Production

- SWFT

Staging

```
#RDP c3cloud.swft.nhs.uk
```

```
#TIS MongoDB
```

```
docker run -d --name=c3cloud_test_tismongodb --restart unless-stopped -v
c3cloud_test_tismongodb:/data/db -p 6105:27017 mongo:4.0
```

```
#TIS Web App
```

```
docker run -d --name=c3cloud_test_tis --restart unless-stopped -v
d:/EMISFTP:/tmp -p 6104:80 docker-registry-
c3cloud.osakidetza.eus/c3cloud/tis:1.0
```

Production

Stop

```
docker stop <container_id>
```

```
docker rm <container_id>
```

Switch version

```
#follow the stop procedure in 4.2 to stop the running container
```

```
#follow the start procedure in 4.1 and change version number in docker run command
```

```
docker run ... docker-registry-c3cloud.osakidetza.eus/c3cloud/tis:<new version>
```

5. TROUBLESHOOTING

- *Most application errors are expected to come from the data import process. TIS has built-in error reporting function for this type of error. As described in section 2 step 7, a task execution error is reported in the Import > Execution Log page. Administrative users of TIS can report the error to University of Warwick for inspection.*
- *Application internal errors are generally captured in application log files. If TIS reports server internal error or stops responding, administrative users can send log files to University of Warwick for support. The location of application logs is listed in Table 5.*

Table 5 TIS log file location

Pilot Site	Staging	Production
OSAKI	/c3cloud/staging/tis/logs	
RJH	/srv/c3cloud/tis/logs	
SWFT	D:\EMISFTP\logs	

Appendix 15 - C3-Cloud Semantic Interoperability Suite (SIS) Technical User Manual

1. DESCRIPTION OF THE INFORMATION SYSTEM

Definition and objectives

The SIS handles both structural mappings among different information models and resolves semantic mismatches due to the use of different terminology systems and different compositional aggregations, used to represent the same clinical concept. Due to local implications of terminologies used, the SIS is developed in close relation with the pilot sites.

Two different types of mappings are performed in the semantic interoperability suite: structural mappings and semantic mappings. Structural mappings are involved in the translation between local pilot sites data in local format and FHIR resources data format used in C3-Cloud. Semantic mappings perform the transcoding between coding systems used in local sites and within C3-Cloud components.

List of applications

The functional requirement specifications for SIS can be summarised as follows:

- SIS maps input data from pilot sites, provided in their local format, to corresponding Fast Healthcare Interoperability Resources (FHIR).
- SIS provides coding values and related coding system used from locally coded pilot site data.

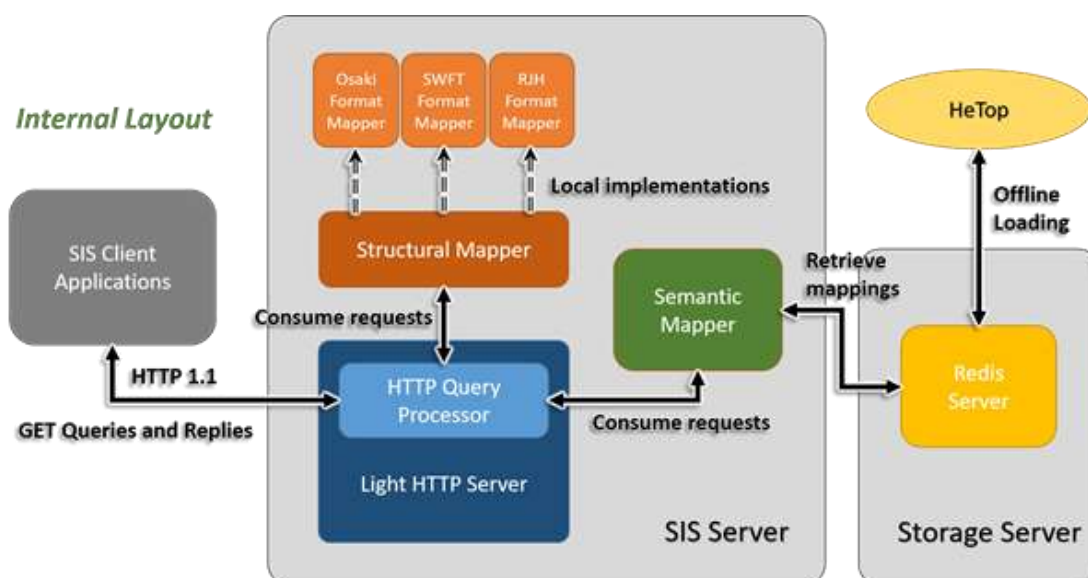


Figure 159 Semantic Interoperability Suite Architecture

The architecture of the SIS is provided in Figure 159. SIS is articulated around two main sub-components: SIS Structural Mapper and SIS Semantic Mapper.

SIS Structural Mapper

The structural mapper of SIS is the internal SIS sub-component in charge of the generation of FHIR resources, which must be filled with data provided in pilot site local format by TIS. To achieve its purpose, the structural mapper consists of pilot site dedicated local format mappers. These mappers provide precise mappings to create correspondence to every relevant data exported by the pilot site to its correct interpretation and place in FHIR resource. FHIR resources mapped from pilot site data are defined in the C3-Cloud data dictionary, which is defined in D6.1-C3-Cloud Technical Interoperability Implementation Guidelines and Open Source Toolkits.

SIS Semantic Mapper

The semantic mapper of SIS is in charge of transforming, using the vocabulary used to describe data exported by pilot site into standard codes that will be used in the high-level components of C3-Cloud. A clinical concept mapping sheet is being maintained as the source of truth, which includes all the clinical concepts that are needed by the CDS services, in reference terminologies like SNOMED-CT and WHO ATC, and all the local codes that are used by the pilot sites for these concepts.

The main features of the SIS semantic mapper are the following:

- C3-Cloud SIS is implemented as a fully deployable exchange suite, running on independent Docker containers.
- It is based on HTTP communication standards, with embedded JSON content.
- It supports FHIR inputs and outputs, and previously mapped local format pilot site inputs.
- SIS is developed using Java 8 Maven.
- Regarding the terminology server, Python 3 is used to develop an application that reads the mappings from use case files and creates an HTTP service (Flask) that is able to achieve the tasks listed in the specifications.
- The C3-Cloud Semantic Interoperability Suite can be easily deployed by running its related Docker image as containers.

The Structural Mapper generates JSON encoded FHIR resources. The semantic mapping is based on a pre-filled registry containing, for each concept, the corresponding code(s) for each site's terminology, and the code used as reference by C3-Cloud. The registry is continuously updated, via a dedicated service method during the time of the project. Multiple codes can be specified for a single concept if the used terminology has several codes corresponding to the concept (narrower-than relation). Multiple terminologies are used as reference, in order to match each concept exactly.

The semantic mapping service is called in two different scenarios:

- Inside the 6.2 interoperability suite, in order to perform the transcoding of local codes to standard codes.
- By C3DP, in order to match patient data coded in pilot sites' terminologies to the clinical concepts that are needed by the CDS services.

The details of the Semantic Interoperability Suite are explained in the deliverable D6.2 – C3-Cloud Semantic Interoperability Platform.

2. OPERATION

Starting and stopping the service

[OSAKI] docker command

```
“docker run -d -p 6101:9000 --name osaki-sm-test docker-registry-  
c3cloud.osakidetza.eus/c3cloud/osakimapper:0.3”
```

Stopping / Restart / Remove = usual docker cycle (based on name of container)

[RJH] docker command

The docker compose file is located: /srv/c3cloud/sms

```
“sudo docker-compose -f docker-compose-rjh.yml -p c3cloud_test up -d”
```

In case of component deployment, docker-compose-rjh.yml should be updated depending view version of docker image.

Stopping / Restart / Remove = usual docker cycle (based on name of container)

[SWFT] docker command

The docker compose file is located: D:\docker-containers\staging\sms

```
“sudo docker-compose -f docker-compose-smMos.yml -p c3cloud_test up -d”
```

In case of component deployment, docker-compose-rjh.yml should be updated depending view version of docker image.

Stopping / Restart / Remove = usual docker cycle (based on name of container)

Batch processes

None

Monitoring

None

3. RESOLUTION INCIDENTS

General platform problems

In case of any issue with SIS, ideal will be to send problematic data (after anonymisation) to eric.sadou@gmail.com

4. APPLICATION OPERATIONS

Deployment of new version

New version will be provided on OSAKI private repo.

[OSAKI]: deployment process: remove current container and update the start command depending the version number.

[RJH][SWFT]: update the docker-compose file, remove and use the start command provided

Uninstall and revert to previous version

Usual docker processes since the images are not removed on the local computer.

Appendix 16 - C3-Cloud Security and Privacy Suite (SPS) Technical User Manual

1. DESCRIPTION OF THE INFORMATION SYSTEM

Definition and objectives

The Security and Privacy Suite (SPS) is responsible for authentication and authorisation of Care Team Members, while they are managing personalised care plans of patients and accessing sensitive personal data; and ensuring that all data exchange within and across C3-Cloud software components is encrypted and properly auditable.

In the C3-Cloud architecture, the patient's electronic health records received from the local EHR systems via the TIS, patient reported observations from the PEP, and the care plan of the patient managed through C3DP are all managed in the C3-Cloud FHIR Repository. Hence, each of these client apps, i.e. TIS, PEP and C3DP needs to be authenticated and authorized to access (read, write, update) patient data to C3-Cloud FHIR Repository, via the functionalities provided by the SPS. All such operations need to be logged for ensuring accountability via SPS.

SPS enables authentication of the care team members into the C3-Cloud applications in two ways: i) via their already existing accounts (e.g., username-password) provided by the local authorities by integrating with the existing Identity Provider (IdP) systems of the pilot sites; and ii) by creating C3-Cloud specific user accounts for those users whose IdP's cannot be integrated with the SPS, e.g. the social care workers.

The SPS has three sub-components:

- **C3-Cloud SPS Server** provides services for user registration, privacy policy management and endpoints defined in **OpenID Connect 1.0** standard to perform authentication and authorization (Authorization Endpoint, Token Endpoint, etc.). By implementing OpenID Connect API, it serves C3-Cloud Identity Provider (IdP), which is the default IdP when the IdP of some users (e.g., social care workers) of the pilot sites cannot be integrated within the scope of the project. The SPS Server also manages the C3-Cloud Access Control Policy Store.
- **C3-Cloud SPS Manager** is a web application for representing the functionalities of C3-Cloud SPS Server with the following user interfaces; single sign on UIs, policy management UI, client registration UI, user registration UI and audit viewer UI.
- **Audit Record Repository** is a FHIR repository that maintains audit trail records implemented as FHIR AuditEvent resource. In C3-Cloud architecture, the C3-Cloud FHIR Repository is used as the Audit Record Repository. An extra instance of the same repository is not created for practical reasons.

Further details regarding SPS can be found in C3-Cloud deliverable D6.3 - Open Source Privacy and Security Toolkits for the C3-Cloud Architecture.

List of applications

SPS is decomposed into the following deployable artefacts, all of which are packed as a Docker image:

- **SPS Server & Manager:** The SPS is based on onAuth security and privacy framework of SRDC, which has been implemented within the scope of not just C3-Cloud but also further international and local projects of SRDC. It is a generic framework to cover the needs of healthcare and other vertical domains. It implements the widely preferred modern authorization

specifications, such as OpenID Connect 1.0 and OAuth 2.0. Each user is authenticated with the OAuth 2 flow and authorized for the allowed scopes with a JWT token. This token is exchanged between components to ensure that a user / system is authorized. This deployable artefact includes both backend and frontend implementation. Backend is implemented natively in Scala and the frontend is implemented in Angular framework. The Docker image is based on java8 image by SRDC, in which an nginx server is also installed for serving the frontend.

- **MongoDB Database:** SPS uses MongoDB as the NoSQL database. The configuration of the pilot site environment including the privacy policy, registered clients, roles, users, etc. are all kept in the MongoDB database. The most recent version 4.0 is used for deployment. The official Docker image is used without any modification.
- **Redis Data Store:** SPS uses Redis as a cache for keeping the active tokens of all clients that have recently acquired a valid token, for preventing calls to the underlying MongoDB database whenever possible. The official Docker image is used without any modification.

2. OPERATION

Configuration

The configuration files and execution scripts of three Docker containers of C3-Cloud SPS are presented in the following sub-sections.

SPS Server & Manager Container

The Docker image of C3-Cloud SPS Server & Manager is built and published by SRDC. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/c3cloud/sps**.

The **sps** sub-folder of the Docker containers root folder contains the following configuration files and folder:

1. **docker-compose.yml (docker-compose-bc.yml OR docker-compose-rjh.yml OR docker-compose-swft.yml):** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used, the port binding from the host to the Docker container (80 port in the container <-> 6004 in the host for staging), the binding of the current folder in the host to the Docker container as “/sps” for passing further configuration files and lastly a number of environment variables to be passed to the Docker container:
 - a. **APP_CONF_FILE:** The path to the configuration file of SPS Server & Manager.
 - b. **FHIR_HOST:** The root URL of the FHIR Repository in the C3-Cloud architecture.
 - c. **AUDIT_HOST:** The root URL of the Audit Record Repository in the C3-Cloud architecture. In C3-Cloud, the common FHIR Repository is also used as the Audit Record Repository; but configuration allows it to be different.
 - d. **ONAUTH_SERVER_NAME:** The domain name of the C3-Cloud SPS Server & Manager that is being deployed. It is required for correct virtual host configuration in the nginx Web server inside the Docker container.
 - e. **ONAUTH_SERVER_PORT:** The port of the C3-Cloud SPS Server & Manager that is being deployed. If it is default HTTP or HTTPS ports (i.e. 80 or 443), it is not recommended to set the port explicitly.
 - f. **ONAUTH_SERVER_PATH:** The URL suffix of the C3-Cloud SPS Server & Manager that is being deployed.

- g. **ONAUTH_SERVER_PROTOCOL**: The protocol of the C3-Cloud SPS Server & Manager that is being deployed. It can either be http or https depending on the setup. According to latest decisions, it should be https in RJH and SWFT and http in BC.
- h. **DOCKER_CONTAINER_HOST**: The name of the Docker container that is containing the SPS Server & Manager. It is always 'sps' in our case. It might be needed for correct virtual host configuration in the nginx Web server inside the Docker container.

Script 1 – docker-compose.yml

```
version: '2.0'

services:
  sps:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/sps
    environment:
      - APP_CONF_FILE=/sps/application-swft.conf
      - FHIR_HOST=https://c3cloud.swft.nhs.uk/test/fhir/
      - AUDIT_HOST=https://c3cloud.swft.nhs.uk/test/fhir/
      - ONAUTH_SERVER_NAME=c3cloud.swft.nhs.uk
      # - ONAUTH_SERVER_PORT=8080
      - ONAUTH_SERVER_PATH=test/onauth
      - ONAUTH_SERVER_PROTOCOL=https
      - DOCKER_CONTAINER_HOST=sps
    ports:
      - "6004:80"
    volumes:
      - ./:/sps
    restart: always
```

2. application.conf (application-bc.conf OR application-rjh.conf OR application-swft.conf):

This is the detailed configuration file of the SPS Server & Manager. Several configuration parameters are fixed for C3-Cloud setup and do not need to be changed at all during the pilot duration. The important parameters that might need to be updated can be listed as follows:

- a. **mongodb**: The connection parameters for the mongodb database.
- b. **redis**: The connection parameters for the redis data store (cache).
- c. **pds.location.url**: The base URL of the C3-Cloud FHIR Repository. This is overridden by the FHIR_HOST environment variable in the docker-compose file, so it does not need to be changed from here in practice.
- d. **onauth.base-url & onauth.server**: The base URL and host name / port configurations of the SPS Server & Manager that is being deployed. These are overridden by the ONAUTH_SERVER_NAME, ONAUTH_SERVER_PORT, ONAUTH_SERVER_PATH and ONAUTH_SERVER_PROTOCOL environment variables in the docker-compose file, so they do not need to be changed from here in practice.

- e. **oid.external-provider-definitions:** Contains the paths to the configuration files for external Identity Provider systems. This concerns OpenID Connect compliant ADFS of RJH and custom JWT token integration mechanism of BC.
- f. **privacy.external-realm-definitions:** Contains the path to the main directory of C3-Cloud realm definition folder, which includes the privacy policy, roles, scopes, etc. definitions as explained in the next item.
- g. **mail:** Contains SMTP parameters for a valid email account that is to be used while sending emails to the users about new user account registrations or password reset requests. It needs to be filled in with a valid SMTP account, preferably specific to the C3-Cloud project per pilot site.

Script 2 – application.conf

```
spray.can {
  server {
    parsing{
      uri-parsing-mode= relaxed
    }
    server-header = onAuth.io
    ssl-encryption = off
  }
}

akka {
  loggers = [akka.event.slf4j.Slf4jLogger]
  loglevel = off
  actor {
    debug {
      receive = off
      lifecycle = off
    }
  }
}

http.server {
  # Defines the default time period within which the application has to
  # produce an HttpResponse for any given HttpRequest it received.
  # The timeout begins to run when the *end* of the request has been
  # received, so even potentially long uploads can have a short timeout.
  # Set to `infinite` to completely disable request timeout checking.
  #
  # If this setting is not `infinite` the HTTP server layer attaches a
  # `Timeout-Access` header to the request, which enables programmatic
```

```

    # customization of the timeout period and timeout response for each
    # request individually.
    request-timeout = 120 s
  }
}

mongodb {
  host=svfwhc3appsw10.xswhc.nhs.uk
  port=6007
  db=c3cloud-onauth
  logger=false
  #Uncomment below if MongoDB requires user authentication
  #authdb=""
  #username=""
  #password=""
}

redis {
  host=svfwhc3appsw10.xswhc.nhs.uk
  port=6008
  #password = ""
}

pds {
  location {
    url="https://c3cloud.swft.nhs.uk/test/fhir"
  }
}

c3cloud {
  # Used for adding identifiers(real) to C3-Cloud FHIR resources (only used with
  C3CloudIntegrator)
  real-identifier = "http://www.c3-cloud.eu/Identifier/real"
  # User for adding identifiers(pseudonym) to C3-Cloud FHIR resources (only used
  with C3CloudIntegrator)
  pseudonym-identifier = "http://www.c3-cloud.eu/Identifier/pseudonym"
}

onauth {

```

```

# OnAuth installation base URL
base-url="https://c3cloud.swft.nhs.uk/test/onauth"
development-mode = off
#OnAuth Server Configurations
server {
    host = 127.0.0.1
    host-name = "c3cloud.swft.nhs.uk"
    path-name = "test/onauth/api"
    port = 8081
    path = api
}
#OnAuth Manager Web Application Configurations
manager {
    base {
        url = "onauth-manager"
    }
    login {
        url="login"
    }
    consent {
        url="consent"
    }
    2fa {
        url="2fa"
    }
    main {
        url="home"
    }
    information {
        url="information"
    }
}

# Onauth

# OnAuth's relative redirect URI for External Devices/Apps authorization
device {
    redirect {

```

```

        url = "integrate/redirect"
    }
}

# Invalidates user account and forces user to change assigned password on
registration
invalidate-on-register = true

# OpenId Provider details
oid {
    onauth-manager {
        url = "/sps/conf/onauth-manager-client-metadata.json"
    }
    sample-client {
        url = "/sps/conf/sample_client.json"
    }
    # If client registration is allowed after setup
    client-registration = false
    # Client access token timeout
    # 1 day
    access-token-timeout = "1d"
    # Client refresh token timeout
    # 1 week
    refresh-token-timeout = "7d"

    # Directory of the external OpenID provider definitions
    external-provider-definitions = [
        "/sps/conf/providers/rjh.json",
        "/sps/conf/providers/osakidetza.json"
    ]

    external-provider-redirect {
        url = "provider/redirect"
    }

    # Provider metadata config file (discovery endpoints)
    provider-metadata-path = "/sps/conf/onauth-oid-provider-metadata.json"
}

```

```

privacy {
    # Main directory of the realm definition, may include following folders:
    # - credentials -> definition of default credentials,
    # - groups -> definition of default groups,
    # - privacy-policy -> policy definitions,
    # - privacy-policy/resource-set -> resource-set definitions,
    # - privacy-policy/roles -> role definitions,
    # - privacy-policy/scopes -> scope definitions,
    # - privacy-policy/policy.json -> policy definition in JSON format
    # - users -> definition of the user information for the credentials,
    # - realm.json -> realm metadata in JSON format

    external-realm-definitions= [
        "/sps/conf/realms/c3cloud"
    ]

    # When init is true initialization process drops the Mongo and Redis
    databases
    # recreates them with the metadata provided.
    init = "safe"
}

session {
    cookie {
        secret="12345"
    }
    timeout-anonymous = 30m
}

2fa {
    api-key = "APIKEY"
    api-url = "https://platform.clickatell.com/messages/http/send"
    sms-content = {
        en = " is the one time secure code for signing in to the Onauth Manager."
    }
}

mail {

```



```

from-name = "C3-Cloud Project"
from-email = "c3cloud@c3-cloud.eu"
hostname = "SMTP.EXAMPLE.COM"
smtp-port = 587
username = "c3cloudproject"
password = "PASSWORD"
# Mail content texts
content {
    orgNameAddress = "H2020 C3-Cloud - A Federated Collaborative Care Cure
Cloud Architecture for Addressing the Needs of Multi-morbidity and Managing Poly-
pharmacy"
    poweredByHref = "www.c3-cloud.eu"
    poweredByText = "C3-Cloud Consortium"
    # Specific to Invitation emails
    invitation {
        subject {
            en = "C3-Cloud Registration"
            nl = "C3-Cloud-Registratie"
            es = "Registro C3-Cloud"
        }
        content {
            en = "Congratulations, you are registered to C3-Cloud care program!
Please complete the registration in order to use C3-Cloud system and
applications."
            nl = "Gefeliciteerd, u bent geregistreerd voor het C3-Cloud-zorgprogramma!
Voltooi de registratie om het C3-Cloud-systeem en de applicaties te gebruiken."
            es = "Felicitaciones, esta registrado en el programa de atencion C3-Cloud!
Complete el registro para poder usar el sistema C3-Cloud y sus aplicaciones."
        }
        ctaText {
            en = "Complete Registration"
            nl = "Voltooi Registratie"
            es = "Registro completo"
        }
    }
    prenewal {
        subject = {
            en = "C3-Cloud Password Renewal"
            nl = "C3-Cloud Wachtwoordvernieuwing"
            es = "Renovación de contraseña"
        }
    }
}

```

```

    }

    content {

        en = "You have requested to renew your password (If not please contact
with your C3-Cloud contacts)! Click to the following link to proceed with the
password renewal process."

        nl = "U hebt gevraagd om uw wachtwoord te vernieuwen (neem anders contact
op met uw C3-Cloud-contactpersonen)! Klik op de volgende koppeling om door te
gaan met het proces voor het vernieuwen van het wachtwoord."

        es = "Ha solicitado renovar su contraseña (si no, pongase en contacto con
sus contactos C3-Cloud). Haga clic en el siguiente enlace para continuar con el
proceso de renovación de la contraseña."

    }

    ctaText {

        en = "Reset Password"

        nl = "Reset Wachtwoord"

        es = "Restablecer la Contraseña"

    }

}

}

}

```

3. **conf/**: This folder is bound to the Docker container via “/sps/conf/” and contains the privacy & security configuration files. Most of these configuration sub-folders and files do not need to be changed at all. The folder is composed of:
 - a. **providers/**: This folder contains the configuration files for external Identity Provider systems. This concerns OpenID Connect compliant ADFS of RJH and custom JWT token integration mechanism of BC.
 - b. **realms/c3cloud/**: This folder is the main directory of the C3-Cloud privacy & security realm. It is composed of:
 - i. **clients/**: Definition of software component clients with their client ids, client secrets and client configuration tokens that can connect to the SPS Server and acquire an access token to be used for accessing patient data in the C3-Cloud FHIR Repository. A default account is created for all C3-Cloud software components that need to connect to the FHIR Repository, i.e. C3DP Web App, C3DP Event API, FHIR Repository, PEP and TIS, in the staging environment. These shall either be completely removed, and new software accounts shall be created via the SPS GUI by the admin; or these default accounts shall be updated with new client secrets at least.
 - ii. **credentials/**: Definition of default user credentials that are created automatically during deployment or running of the SPS Server & Manager. There is one json file per user account credential. These must match with the user information in **users/** folder. There are several test users in this folder that are automatically created in staging, but these must be deleted except **c3dp_admin** and **realm_admin** in production.

- iii. **groups/**: Definition of default groups. There is only one group for C3-Cloud.
- iv. **privacy-policy/**:
 - 1. **resource-set/**: FHIR resource set definitions.
 - 2. **roles/**: C3-Cloud role definitions.
 - 3. **scopes/**: Scope definitions.
 - 4. **policy.json**: C3-Cloud privacy policy definition in JSON format. This can be managed via the SPS GUI by the admin.
- v. **users/**: Definition of the user information corresponding to the credentials, that are created automatically during deployment or running of the SPS Server & Manager. There is one json file per user information. These must match with the credentials information in **credentials/** folder. There are several test users in this folder that are automatically created in staging, but these must be deleted except **c3dp_admin** and **realm_admin** in production.
- vi. **realm.json**: C3-Cloud realm metadata in JSON format.

- 4. **deploy.sh OR deploy.bat**: Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 3 – deploy.sh OR deploy.bat

```
docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/sps
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d
```

- 5. **destroy.sh OR destroy.bat**: Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 4 – destroy.sh OR destroy.bat

```
docker-compose -f docker-compose-swft.yml -p c3cloud_test down
```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

MongoDB & Redis Containers

This official MongoDB Docker image (version 4.0) is used. Since some pilot sites are not able to access Docker official images library, mongo Docker image is put as is into the Osakidetza Docker registry and pulled from there into all three pilot sites. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/mongo:4.0**.

The official Redis Docker image (version 5.0) is used for caching user security tokens. Similarly to the MongoDB image, Redis Docker image is put as is into the Osakidetza Docker registry and pulled from there into all three pilot sites. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/redis:5.0**.

There is not much to configure both for MongoDB and Redis. The **sps-mongo-redis** sub-folder of the Docker containers root folder contains the following three files:

- 1. **docker-compose.yml**: Configuration file that is used by docker-compose to start or stop & remove SPS MongoDB and Redis Docker containers based on the Docker images. A single

docker-compose configuration manages both MongoDB and Redis for ease of use, since they are indeed used together by the SPS Server. The configuration file states the Docker images to be used, the port binding from the host to the Docker container (27017 default mongodb port in the container <-> 6007 in the host for staging; and 6379 default redis port in the container <-> 6008 in the host for staging), and the storage volume to be used by the database. There is a difference in usage of volume between Linux and Windows servers as shown in the scripts below. In Linux servers, **data/db** folder is created in the same folder and bound to the MongoDB Docker container, while in Windows servers this folder binding does not work for write operations, so a Docker volume titled **spsmongodb** is created and used in Windows server. Similarly, in Linux servers, **data/redis** folder is created in the same folder and bound to the Redis Docker container, while in Windows servers this folder binding does not work for write operations, so a Docker volume titled **spsmongoredis** is created and used in Windows server. In both cases, no data is stored inside the Docker container. Even if the Docker container is deleted, the data will be safe.

Script 5 – docker-compose.yml [in Linux server, i.e. BC and RJH]

```
version: '2.0'

services:

  sps_mongo:

    image: docker-registry-c3cloud.osakidetza.eus/mongo:4.0

    ports:

      - "6007:27017"

    volumes:

      - ./data/db:/data/db

    restart: always

  sps_redis:

    image: docker-registry-c3cloud.osakidetza.eus/redis:5.0

    ports:

      - "6008:6379"

    command: redis-server --appendonly yes

    volumes:

      - ./data/redis:/data

    restart: always
```

Script 6 – docker-compose.yml [in Windows server, i.e. SWFT]

```
version: '2.0'

volumes:

  spsmongodb:

  spsredisdb:

services:
```

```

sps_mongo:
  image: docker-registry-c3cloud.osakidetza.eus/mongo:4.0
  ports:
    - "6007:27017"
  volumes:
    - 'spsmongodb:/data/db'
  restart: always

sps_redis:
  image: docker-registry-c3cloud.osakidetza.eus/redis:5.0
  ports:
    - "6008:6379"
  command: redis-server --appendonly yes
  volumes:
    - 'spsredisdb:/data'
  restart: always

```

2. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker images from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 7 – deploy.sh OR deploy.bat

```

docker pull docker-registry-c3cloud.osakidetza.eus/mongo:4.0
docker pull docker-registry-c3cloud.osakidetza.eus/redis:5.0
docker-compose -f docker-compose.yml -p c3cloud_test up -d

```

3. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 8 – destroy.sh OR destroy.bat

```

docker-compose -f docker-compose.yml -p c3cloud_test down

```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

Starting and stopping the service

A brand new execution of the Docker containers explained in this document is done via executing the **deploy.sh OR deploy.bat** script in the corresponding setup folder.

Once a Docker container is created from the corresponding Docker image and run by the **docker-compose** command inside the deploy script, it can be stopped by **docker stop <container_name>** command, and once stopped, it can be started again by **docker start <container_name>** command.

In order to completely stop and remove a Docker container, it is necessary to run the **destroy.sh** or **destroy.bat** script in the corresponding setup folder.

Batch processes

There is no batch process in this case.

Monitoring

The actively running Docker containers in a server can be listed via **docker ps** command as shown below. The last column is the container name, e.g. **c3cloud_test_sps_1**. It is recommended to use PowerShell in Windows servers. In Linux servers, a random number can be suffixed to the container name, such as **c3cloud_test_sps_1_421421421**, by docker-compose.

Script 9 – Listing running Docker containers

```
$> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED
STATUS	PORTS	NAMES	
12e51c3d4fbc	docker-registry-c3cloud.osakidetza.eus/c3cloud/sps	"/onauth/docker-entr..."	3
weeks ago	Up 3 weeks	0.0.0.0:6004->80/tcp	c3cloud_test_sps_1
57149c7c9f26	docker-registry-c3cloud.osakidetza.eus/redis:5.0	"docker-entrypoint.s..."	7
weeks ago	Up 4 weeks	0.0.0.0:6008->6379/tcp	c3cloud_test_sps_redis_1
f60ff54cbb31	docker-registry-c3cloud.osakidetza.eus/mongo:4.0	"docker-entrypoint.s..."	7
weeks ago	Up 4 weeks	0.0.0.0:6007->27017/tcp	c3cloud_test_sps_mongo_1

The logs can be accessed by using the **docker logs <container_name>** command. The log file can be quite long after some up time, so it is recommended to jump to the most recent logs, e.g. to the last 100 lines via **docker logs --tail 100 <container_name>** command. Logs are quite verbose, so when there is a problem with the SPS, the first place to check would be the logs for a possible exception. An example log output is provided below.

Script 10 – Checking logs of FHIR Repository

```
$> docker logs --tail 100 c3cloud_test_sps_1
```

```
.....

15:02:26.801 [scala-execution-context-global-34675] INFO OpenID-Token-Service - Successful Retrieval
operation on credentials with userId 3c670b96-8657-4fe7-bc48-b4352a2b5211.

15:02:26.801 [scala-execution-context-global-34676] INFO OpenID-Smart-Scope-Service - Successful
Retrieval operation on users with sub 3c670b96-8657-4fe7-bc48-b4352a2b5211.

15:02:26.804 [scala-execution-context-global-34676] INFO OpenID-Smart-Scope-Service - Successful
Retrieval operation on credentials with userId 3c670b96-8657-4fe7-bc48-b4352a2b5211.

15:02:26.804 [scala-execution-context-global-34676] DEBUG OpenID-Smart-Scope-Service - User Credential
Roles Set(practitioner)

15:02:26.804 [scala-execution-context-global-34676] DEBUG OpenID-Smart-Scope-Service - User scope
extraction requested for anna_annanna

15:02:26.806 [scala-execution-context-global-34676] DEBUG OpenID-Smart-Scope-Service - User roles;
Set(practitioner)

15:02:26.812 [scala-execution-context-global-34676] DEBUG OpenID-Token-Service - Scope context:
ScopeContext(Set(user/CarePlan.$profile-transcode, user/ValueSet.$expand,
user/AllergyIntolerance.$distinct-pages, user/MedicationStatement.write, user/Group.write,
```

```

user/UserInfo.write, user/MedicationAdministration.write, offline_access, user/HealthcareService.write,
user/RequestGroup.write, user/ReferralRequest.write, user/RiskAssessment.write, user/AuditEvent.read,
user/AppointmentResponse.write, user/Parameters.write, user/Composition.write, user/Person.write,
user/ConceptMap.write, user/Goal.write, user/FamilyMemberHistory.write,
user/QuestionnaireResponse.write, user/Encounter.$distinct-pages, user/PractitionerRole.write,
user/Condition.$distinct-pages, user/Media.write, user/List.write, user/Communication.write,
user/CodeSystem.write, user_claims, user/Patient.write, user/ActivityDefinition.write,
user/Immunization.write, user/Practitioner.write, user/MedicationStatement.$distinct-pages, openid,
user/Patient.$c3dp-cdsm, user/RelatedPerson.write, user/AllergyIntolerance.write, user/ValueSet.write,
user/ProcedureRequest.write, user/DeviceRequest.write, user/MedicationRequest.write,
user/CareTeam.write, user/Medication.write, user/Immunization.$distinct-pages, profile,
user/MedicationDispense.write, user/CommunicationRequest.write, user/DiagnosticReport.write,
user/Location.write, user/Procedure.write, user/Observation.$distinct-pages, user/Endpoint.write,
user/Observation.write, user/Procedure.$distinct-pages, user/Questionnaire.write, user/Parameters.$cds-
config, user/Composition.$document, user/Appointment.write, user/CarePlan.write,
user/MedicationRequest.$distinct-pages, user/FamilyMemberHistory.$distinct-pages, user/Condition.write,
user/Bundle.write, user/Patient.$c3dp-profile, user/CarePlan.$careplan-manage, user/Device.write,
user/Organization.write, user/Encounter.write), Set (user/CarePlan.$profile-transcode,
user/ValueSet.$expand, user/AllergyIntolerance.$distinct-pages, user/MedicationStatement.write,
user/Group.write, user/UserInfo.write, user/MedicationAdministration.write, offline_access,
user/HealthcareService.write, user/RequestGroup.write, user/ReferralRequest.write,
user/RiskAssessment.write, user/AuditEvent.read, user/AppointmentResponse.write, user/Parameters.write,
user/Composition.write, user/Person.write, user/ConceptMap.write, user/Goal.write,
user/FamilyMemberHistory.write, user/QuestionnaireResponse.write, user/Encounter.$distinct-pages,
user/PractitionerRole.write, user/Condition.$distinct-pages, user/Media.write, user/List.write,
user/Communication.write, user/CodeSystem.write, user_claims, user/Patient.write,
user/ActivityDefinition.write, user/Immunization.write, user/Practitioner.write,
user/MedicationStatement.$distinct-pages, openid, user/Patient.$c3dp-cdsm, user/RelatedPerson.write,
user/AllergyIntolerance.write, user/ValueSet.write, user/ProcedureRequest.write,
user/DeviceRequest.write, user/MedicationRequest.write, user/CareTeam.write, user/Medication.write,
user/Immunization.$distinct-pages, profile, user/MedicationDispense.write,
user/CommunicationRequest.write, user/DiagnosticReport.write, user/Location.write, user/Procedure.write,
user/Observation.$distinct-pages, user/Endpoint.write, user/Observation.write, user/Procedure.$distinct-
pages, user/Questionnaire.write, user/Parameters.$cds-config, user/Composition.$document,
user/Appointment.write, user/CarePlan.write, user/MedicationRequest.$distinct-pages,
user/FamilyMemberHistory.$distinct-pages, user/Condition.write, user/Bundle.write, user/Patient.$c3dp-
profile, user/CarePlan.$careplan-manage, user/Device.write, user/Organization.write,
user/Encounter.write), None, false)

15:02:26.814 [scala-execution-context-global-34676] INFO  OpenID-Token-Service - Successful Retrieval
operation on credentials with userId 3c670b96-8657-4fe7-bc48-b4352a2b5211.

19:10:46.021 [onauth-akka.actor.default-dispatcher-32771] DEBUG OAuth-TokenEndpoint - Client credentials
request is initiated...

19:10:46.025 [scala-execution-context-global-34935] INFO  OpenID-Authentication-Service - Successful
Retrieval operation on client_metadata with client_id event-api.

19:10:46.025 [scala-execution-context-global-34936] DEBUG OpenID-Authentication-Service - Client C3DP
Event API is authenticated with client_secret_basic

19:10:46.028 [scala-execution-context-global-34936] INFO  OpenID-Token-Service - Successful Retrieval
operation on client_metadata with client_id event-api.

```

3. RESOLUTION OF INCIDENTS

General platform problems

Common problems that can be observed during piloting can be listed as follows:

1. SPS Server & Manager cannot access MongoDB. Either the mongodb container is down or there is a network problem. The logs will tell if it is not possible to reach the DB.
2. SPS Server & Manager cannot access Redis. Either the redis container is down or there is a network problem. The logs will tell if it is not possible to reach the cache.

3. SPS Server & Manager cannot access C3-Cloud FHIR Repository. This access is needed while trying to display audit trail records in the system to the administrator or while creating a new user account via SPS. The logs will tell if it is not possible to reach the FHIR Repository.
4. SPS Server & Manager cannot send an email to the person who is invited to create an account or to an existing user who tries to reset their password. Either the SMTP configuration is wrong or SPS cannot access the SMTP server. Both the console log of the Web browser and the application logs of the Docker container will tell the problem.
5. It is not possible to login via external Identity Provider. Either the external Identity Provider (i.e. MS ADFS OpenID Connect endpoint) is not accessible in the case of RJH, or there is a problem with JWT token exchange from Osabide Global to C3DP and SPS in the case of BC. These errors will be visible via the GUI displayed in the Web browser.

4. APPLICATION OPERATIONS

Deployment of new version

By default, SRDC deploy scripts and docker-compose files check for the latest version of a Docker image in the staging environment (except for mongodb and redis), so when there is a new version published by SRDC, it is enough to execute destroy and deploy scripts consequently. But in production environment, it would be better to fix the version numbers of all Docker containers in the scripts, so that when there is a new version, it would be necessary to update the deploy script and the docker-compose file.

As an example, assume that c3cloud/sps had version 2.0 and now there is a new version 2.1. It needs to be updated. The following steps should be followed:

1. First step is going into the **sps** folder and executing `destroy.sh` OR `destroy.bat`.
2. Then, it is necessary to update the `docker-compose.yml` file as follows:

Script 11 – Update docker-compose.yml for new version

```
services:
  sps:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/sps:2.1
    environment:
  ...
```

3. The deploy script should be updated as well to pull the latest image from the Docker registry:

Script 12 – Update deploy.sh OR deploy.bat for new version

```
docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/sps:2.1
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d
```

4. Lastly, the Docker container shall be created with the new image version by running `deploy.sh` OR `deploy.bat`.

Uninstall and revert to previous version

For uninstalling a Docker container, the only thing needed is to run the destroy.sh OR destroy.bat script in the corresponding Docker setup folder.

For reverting to a previous version, the same steps explained in the previous section shall be followed. The only difference is that, the version number should not be increased, but decreased.

Appendix 17 - C3-Cloud FHIR Repository Technical User Manual

1. DESCRIPTION OF THE INFORMATION SYSTEM

Definition and objectives

C3-Cloud FHIR Repository acts as the centralized data repository for existing clinical data of the patients and newly created care planning related data. It stores the data, which arrive from EHR systems via TIS and newly created or updated care plan data from other C3-Cloud components like C3DP and PEP, as HL7 FHIR STU3¹ resources. SRDC provides its FHIR Repository product named onFHIR² for free for this purpose, but any other FHIR STU3 server can be used as well. onFHIR was tested successfully at the 15th FHIR Connectathon in Madrid on 6-7 May 2017. FHIR specification conformance of onFHIR has been validated by the Crucible and Touchstone FHIR testing tools and onFHIR performs at the top among tens of FHIR servers. onFHIR also outperforms the publicly available FHIR servers both in read and write operations.

Thanks to C3-Cloud FHIR Repository's automatic auditing functionality, audit trail records are kept for each access and manipulation of data as FHIR AuditEvent resources as well. These audit resources are available from the same API for authorized users with administrator roles as any other FHIR resource. For example, the Audit Viewer interface of the SPS reads the audit records from this API.

Further details regarding C3-Cloud FHIR Repository can be found in C3-Cloud deliverables D7.4 - C3-Cloud Coordinated Care and Cure Delivery Platform and D7.3 - Personalised Care Plan Development Platform.

List of applications

C3-Cloud FHIR Repository is decomposed into the following deployable artefacts, all of which are packed as a Docker image:

- **FHIR Repository Server:** The backend implementation of the FHIR STU3 REST API and Search API specifications to full extent. C3-Cloud FHIR Repository, which is based on the onFHIR Secure Health Data Repository product of SRDC is fully compliant with the FHIR STU3 specification. C3-Cloud FHIR Repository is also extensible and configurable for adding custom operations over standard FHIR API. An example for such custom functionalities is the CDS Hooks client, which is implemented specifically for the CDS service interaction needs of the C3-Cloud project. C3DP uses this endpoint to collate all the required patient data needed for calling a CDS service and then doing the actual call to the CDS service, collating the results from the CDS service and finally providing them to the caller. Both onFHIR and C3-Cloud specific operations are implemented natively in Scala. The Docker image is based on java8 image by SRDC.
- **MongoDB Database:** FHIR Repository Server uses MongoDB as the NoSQL database. The most recent version 4.0 is used for deployment. The official Docker image is used without any modification.

¹ <http://hl7.org/fhir/STU3/>

² <https://onfhir.io/>

2. OPERATION

Configuration

The configuration files and execution scripts of two Docker containers of C3-Cloud FHIR Repository are presented in the following sub-sections.

FHIR Repository Server Container

The Docker image of C3-Cloud FHIR Repository Server is built and published by SRDC. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/c3cloud/repo**.

The **mongo** sub-folder of the Docker containers root folder contains the following configuration files and folder:

1. **docker-compose.yml (docker-compose-bc.yml OR docker-compose-rjh.yml OR docker-compose-swft.yml):** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used, the port binding from the host to the Docker container (8080 port in the container <-> 6005 in the host for staging), and the binding of the current folder in the host to the Docker container as “/c3c” for passing further configuration files and lastly the 3 environment variables to be passed to the Docker container:
 - a. **APP_CONF_FILE:** The path to the configuration file of FHIR Repository.
 - b. **FHIR_ROOT_URL:** The root URL of the FHIR Repository that is being deployed.
 - c. **AUTHZ_SERVER_ROOT_URL:** The root URL of the C3-Cloud SPS server.

Script 13 – docker-compose.yml

```
version: '2.0'

services:
  repo:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/repo
    environment:
      - APP_CONF_FILE=/c3c/application-swft.conf
      - FHIR_ROOT_URL=https://c3cloud.swft.nhs.uk/test/fhir
      - AUTHZ_SERVER_ROOT_URL=
https://c3cloud.swft.nhs.uk/test/onauth/api
    ports:
      - '6005:8080'
    volumes:
      - ./:/c3c
    restart: always
```

2. **application.conf (application-bc.conf OR application-rjh.conf OR application-swft.conf):** This is the detailed configuration file of the C3-Cloud FHIR Repository. Several HL7 FHIR configuration parameters at the top are fixed for C3-Cloud setup and do not need to be changed at all during the pilot duration. The important parameters that might need to be updated can be listed as follows:

- a. **mongodb**: The connection parameters for the mongodb database.
- b. **c3dp.sis**: The URLs for SIS translate and mapping services.
- c. **c3dp.date-limitations**: Setup of the expiration dates of main categories of patient medical summary that can be considered as valid data for the CDS services to be called.
- d. **c3dp.cdsm**: Contains the configuration parameters for CDS services:
 - i. **c3dp.cdsm.gdl-base**: The root URL of the GDL2 based CDS services.
 - ii. **c3dp.cdsm.srdc-base**: The root URL of the static CDS services developed by SRDC.
 - iii. **c3dp.cdsm.token**: The security token required by GDL2 based CDS services.
 - iv. **c3dp.cdsm.modules**: Contains the configuration data per each CDS service as an array. It is composed of id, endpoint (composed by concatenating base URLs with CDS specific suffixes), prefetch (clinical concepts that are needed by the CDS service as input), required (any mandatory clinical concept), diseases (the associated major chronic diseases for this CDS service) and hlg (the associated high-level goal for this CDS service).
- e. **c3dp.disease-profile.filename.holistic**: The file path for the holistic profile json file that contains the clinical concepts and their definitions that are used as input to the CDS services.

Script 14 – application.conf

```
server {
    host = 0.0.0.0
    port = 8080
    base-uri = fhir

    ssl {
        #Path to the keystore
        keystore = null
        #Password of the keystore
        password = null
    }
}

spray.can {
    server {
        parsing{
            uri-parsing-mode= relaxed
        }

        server-header = C3-Cloud FHIR Repository
        ssl-encryption = off
        request-timeout = 55 s
        idle-timeout = 60 s
        remote-address-header = on
    }
}
```

```

    }
}

fhir {
    #Whether to initialize from configuration files, or normal execution of server
    initialize = true

    #Version of the FHIR standard to be supported (i.e. "dstu2" or "stu3")
    version = "stu3"

    # Root URL for Server Access (this can be different from server.properties due
    to deployment alternatives)
    root-url = "http://127.0.0.1:8080/fhir"

    # Root URL for FHIR Infrastructure Resource definitions (Conformance,
    StructureDefinition, etc), if null this will be same with root-url
    definitions-url = "http://www.c3-cloud.eu/fhir"

    #Validation alternatives
    # base => HAPI Schema and Schematron Validation (base FHIR specification)
    # profile => HAPI Instance validation (validation against profiles)
    # none => Disable resource validation
    validation = "base"

    # Search mechanism handling alternatives
    # handling=lenient => Ignores unknown/unsupported parameters and perform search
    # handling=strict => Returns an error if unknown/unsupported parameters are
    used
    search-handling = "handling=lenient"

    initialization {
        //Path to definitions.zip that includes the base definitions
        base-definitions-path = null

        #Conformance Path
        conformance-path = "/c3c/conf/conformance.xml"

        #Profiles Path
        profiles-path = null

        #Parameters Path
        parameters-path = "/c3c/conf/search-parameters.zip"
    }
}

```

```

#CompartmentDefinition Path
compartments-path = null

#Valuse Sets path
valuesets-path = null

#Operation Definitions path
operations-path = "/c3c/conf/operation/"

#Database indexing configuration
index-conf-path = "/c3c/conf/db-index-conf.json"
}

default {
    #Default preference to return in HTTP responsense. Can be either minimal or
    representation
    return-preference = representation

    #Default page count when returning results from history and search operations
    page-count = 20

    #Default value for [CapabilityStatement|Conformance].rest.resource.versioning
    when not present
    versioning = "versioned"

    #Default value for
    [CapabilityStatement|Conformance].rest.resource.readHistory when not present
    read-history = false

    #Default value for
    [CapabilityStatement|Conformance].rest.resource.updateCreate when not present
    update-create = true

    #Default value for
    [CapabilityStatement|Conformance].rest.resource.conditionalCreate when not
    present
    conditional-create = false

    #Default value for
    [CapabilityStatement|Conformance].rest.resource.conditionalUpdate when not
    present
    conditional-update = false

    #Default value for
    [CapabilityStatement|Conformance].rest.resource.conditionalDelete when not
    present
    conditional-delete = "not-supported"

```

```

}

authorization {

    # Authorization mechanism applied in this repo e.g. none -> No Authorization,
    smart-on-fhir -> Smart on FHIR compliant authorization

    method = "smart-on-fhir"

    # How the access token will be resolved e.g. introspection --> By OAuth2
    introspection, jwt --> Direct JWT evaluation, jwt-introspection --> JWT with
    introspection

    token-resolution = "introspection"

    # If false, we assume fhir-server is registered to the Authorization Server
    manually but then we need registration data from configuration (see resource-
    server-metadata-path)

    # If true (Not-implemented yet), we will register fhir-server during set-up
    authz-server-dynamic-registration = false

    # Path for the metadata file, if not given the default metadata will be used
    resource-server-metadata-path = "/c3c/conf/resource-server-metadata.json"

    # Path for the JWKS file (including signing keys) for our resource server
    (required if authentication method for introspection requires key based
    authentication)

    resource-server-jwks-path = null

    # If none, we assume the metadata of Authorization Server will be given by
    configuration (see authz-server-metadata-path)

    # Other options are; oauth2 -> OAuth2 Discovery , oidc -> OpenID Connect
    discovery

    authz-server-discovery = "none"

    # Full discovery service URL e.g. https://authorize-
    dstu2.smarthealthit.org/.well-known/openid-configuration (required if 'authz-
    server-discovery' is not none)

    # authz-server-discovery-url = ?

    #Root URL of Authorization Server (required if method is not none)
    authz-server-url = "https://c3cloud.swft.nhs.uk/test/onauth/api"

    # Path for the metadata of Authorization Server (required if 'authz-server-
    discovery' is none) See OAuth2 Discovery for required metadata attributes

    # authz-server-metadata-path = ?

    authz-server-metadata-path = "/c3c/conf/authorization-server-metadata.json"

    # Caching preferences for access tokens (both introspection, or jwt)
    accessToken -> Resolved Authz Context (scopes, etc)

    # Max capacity of cache (# of tokens)

    token-caching-max-capacity = 1000

    # Initial capacity of cache (# of tokens)

```

```

    token-caching-initial-capacity = 100
    # Time to live for each token (in minutes)
    token-caching-time-to-live = 30
    # Idle time for each token to remove it from the cache (in minutes)
    token-caching-time-to-idle = 10
  }

  auditing {
    # Remote Audit Repository address (FHIR base url),
    # 'local' -> means we will store them locally
    # 'none' -> means no auditing
    repository = "local"
  }
}

akka {
  loggers = [akka.event.slf4j.Slf4jLogger]
  loglevel = debug
  actor {
    debug {
      receive = off
      lifecycle = off
    }
  }
}

kafka {
  host = localhost
  port = 9092
  topic = raw.fhir
  client.id = fhir
  enabled = false
}

mongodb {
  host=svfwhc3appsw10.xswhc.nhs.uk
  port=6006
  db=fhir

```



```

#Uncomment below if MongoDB requires user authentication
#authdb=""
#username=""
#password=""
}

# C3-Cloud specific configuration parameters
c3dp {
    sis {
        translate = "http://cispro.chu-rouen.fr/c3-cloud/translate/"
        mapping = "http://cispro.chu-rouen.fr/c3-cloud/mappings/"
    }

    # Used only in profile transcoding for the moment
    pilot-sites = ["SWFT"]

    # Major C3-Cloud diseases that are matched with the CDS services below
    # t2d for type 2 diabetes, ckd for chronic kidney disease (renal failure), hf
    # for heart failure, dp for depression
    diseases = [
        {
            id = "t2d"
            codes = "44054006;E11;C10F"
            name = "Type 2 diabetes"
        }
        {
            id = "hf"
            codes = "84114007;I50;G58-1"
            name = "Heart failure"
        }
        {
            id = "ckd"
            codes =
"425369003;431855005;431856006;433144002;431857002;433146000;N18;1Z1"
            name = "Chronic kidney disease"
        }
        {
            id = "dp"
            codes = "35489007;F329;F32.9;1B17"
            name = "Depression"
        }
    ]
}

```

```

]
date-limitations = [
  {
    query = "MedicationStatement"
    date-parameter = "effective"
    month-duration = 18
  }
  {
    query = "Immunization"
    date-parameter = "date"
    month-duration = 18
  }
  {
    query = "Observation?category=survey"
    date-parameter = "date"
    month-duration = 18
  }
  {
    query = "Observation?category=vital-signs"
    date-parameter = "date"
    month-duration = 18
  }
  {
    query = "Observation?category=laboratory"
    date-parameter = "date"
    month-duration = 18
  }
]
# High-level Goals (HLGs)
hlgs = [
  {
    code = "BP-MAN"
    name = "BP Management"
    diseases = "t2d;ckd"
    priority = "high-priority"
  }
  {
    code = "GLUC-MAN"

```

```

    name = "Glucose Management"
    diseases = "t2d"
    priority = "high-priority"
}
{
    code = "LIPID-MAN"
    name = "Lipid Management"
    diseases = "t2d"
    priority = "medium-priority"
}
{
    code = "DIET-LIFE"
    name = "Diet & Lifestyle"
    diseases = "t2d;hf;ckd;dp"
    priority = "low-priority"
}
{
    code = "COMP-MAN"
    name = "Complication Management"
    diseases = "t2d;hf;ckd;dp"
    priority = "low-priority"
}
{
    code = "HF-MAN"
    name = "HF Management"
    diseases = "hf"
    priority = "high-priority"
}
{
    code = "RENAL-MAN"
    name = "Renal Management"
    diseases = "ckd"
    priority = "high-priority"
}
{
    code = "DP-MAN"
    name = "Depression Management"
    diseases = "dp"

```

```

    priority = "medium-priority"
  }
]
# CDS Services
cdsm {
  gdl-base = "https://cds-platform.com/services/c3cloud/v0.3/"
  srdc-base = "https://c3cloud.swft.nhs.uk/test/cds-c3dp/"
  token = "SEC_TOKEN_REPLACED"
  modules = [
    {
      id = "REM_AUTONOMIC_NEUROPATHY"
      endpoint = ${c3dp.cdsm.srdc-base}"autonomic-neuropathy"
      prefetch = "conditions[t2d]"
      required = ""
      diseases = "t2d"
      hlg = "COMP-MAN"
    }
    {
      id = "REM_GLUCOSE_MEDICATION"
      endpoint = ${c3dp.cdsm.srdc-base}"blood-glucose"
      #endpoint = ${c3dp.cdsm.gdl-base}"dm-glucose-
management?token=${c3dp.cdsm.token}"
      prefetch =
"conditions[t2d;hf;symptomatic_hyperglycemia;alcoholism;hepatic_impairment;diabet
ic_ketoacidosis;bladder_cancer;malnutrition;umh;liver_insufficiency;previous_hypo
glycemia;arthrosis_in_hip;arthrosis_in_knee;schizophrenia]
medications[metformin;pioglitazone;sulfonylureas;dpp4;glp1;sglt2;dapagliflozin;ca
nagliflozin;empagliflozin;insulins;bosentan;hypoglycemia_risk]
allergies[metformin_allergy;sulfonylurea_allergy] lab_results[egfr;hba1c]
vital_signs[weight;bmi]"
      required = ""
      diseases = "t2d"
      hlg = "GLUC-MAN"
    }
    {
      id = "REM_BP_MANAGEMENT"
      #endpoint = ${c3dp.cdsm.srdc-base}"blood-pressure"
      endpoint = ${c3dp.cdsm.gdl-base}"dm-blood-pressure-
management?token=${c3dp.cdsm.token}"
      prefetch = "conditions[hypertension;t2d;micro_vascular;cardiovascular]
medications[ace_inhibitors;a2_blocker;calcium_channel_blockers;renin_angiotensin;
diuretics] allergies[ace_allergy] lab_results[albumin_level] vital_signs[bp]"
    }
  ]
}

```

```

        required = ""
        diseases = "t2d"
        hlg = "BP-MAN"
    }
    {
        id = "REM_PAT_EDUCATION"
        endpoint = ${c3dp.cdsm.srdc-base}"patient-education"
        prefetch = "conditions[t2d;hf;ckd;dp]"
        required = ""
        diseases = "t2d;hf;ckd;dp"
        hlg = "DIET-LIFE"
    }
    {
        id = "REM_DIET"
        #endpoint = ${c3dp.cdsm.srdc-base}"diet-plan"
        endpoint = ${c3dp.cdsm.gdl-base}"dm-diet-plan?token=${c3dp.cdsm.token}"
        prefetch = "conditions[t2d;ckd] lab_results[egfr]"
        required = ""
        diseases = "t2d;ckd"
        hlg = "DIET-LIFE"
    }
    {
        id = "REM_ERECTILE_DYSFUNCTION"
        endpoint = ${c3dp.cdsm.srdc-base}"erectile-dysfunction"
        prefetch = "conditions[t2d]"
        required = ""
        diseases = "t2d"
        hlg = "DIET-LIFE"
    }
    {
        id = "REM_EYE_DISEASE"
        endpoint = ${c3dp.cdsm.srdc-base}"eye-disease"
        prefetch = "conditions[t2d]"
        required = ""
        diseases = "t2d"
        hlg = "COMP-MAN"
    }
    {

```

```

        id = "REM_DIABETIC_FOOT"

        #endpoint = ${c3dp.cdsm.srdc-base}"foot-problem"

        endpoint = ${c3dp.cdsm.gdl-base}"dm-foot-
problem?token=${c3dp.cdsm.token}

        prefetch =
"conditions[t2d;ulceration;spreading_infection;critical_limb_ischaemia;gangrene;a
cute_arthropathy;neuropathy;non_critical_limb_ischaemia;callus_of_limb;deformity_
of_limb;amputation_cond] procedures[amputation_proc;renal_replacement_therapy]
medications[ulceration_therapy]"

        required = ""

        diseases = "t2d"

        hlg = "COMP-MAN"
    }
    {
        id = "REM_GASTROPARESIS"

        endpoint = ${c3dp.cdsm.srdc-base}"gastroparesis"

        prefetch = "conditions[t2d]"

        required = ""

        diseases = "t2d"

        hlg = "COMP-MAN"
    }
    {
        id = "REM_HBA1C_TARGET"

        #endpoint = ${c3dp.cdsm.srdc-base}"hba1c-target"

        endpoint = ${c3dp.cdsm.gdl-base}"dm-hbA1c-
targets?token=${c3dp.cdsm.token}

        prefetch = "conditions[t2d;ckd;previous_hypoglycemia] lab_results[egfr]
medications[hypoglycemia_risk] risks[frailty]"

        required = ""

        diseases = "t2d;ckd"

        hlg = "GLUC-MAN"
    }
    {
        id = "REM_LIPID_LOWERING"

        #endpoint = ${c3dp.cdsm.srdc-base}"lipid-management"

        endpoint = ${c3dp.cdsm.gdl-base}"dm-lipid-
management?token=${c3dp.cdsm.token}

        prefetch = "conditions[t2d;ckd;cardiovascular;muscle_pain]
medications[atorvastatin] lab_results[ldl;egfr;ast;alt] risks[qrisk]"

        required = ""

        diseases = "t2d"
    }

```

```

        hlg = "LIPID-MAN"
    }
    {
        id = "REM_LIFESTYLE_MANAGEMENT"
        #endpoint = ${c3dp.cdsm.srdc-base}"lifestyle-management"
        endpoint = ${c3dp.cdsm.gdl-base}"dm-lifestyle-
management?token=${c3dp.cdsm.token}
        prefetch = "conditions[hypertension;t2d;hf]
social_history[smoking;alcohol]"
        required = ""
        diseases = "t2d;hf"
        hlg = "DIET-LIFE"
    }
    {
        id = "REM_DIABETIC_NEPHROPATHY"
        endpoint = ${c3dp.cdsm.srdc-base}"nephropathy"
        #endpoint = ${c3dp.cdsm.gdl-base}"dm-nephropathy-
management?token=${c3dp.cdsm.token}
        prefetch = "conditions[t2d;hypertension]
lab_results[hba1c;egfr;albumin_creatinine]"
        required = ""
        diseases = "t2d"
        hlg = "COMP-MAN"
    }
    {
        id = "REM_NEUROPATHIC_PAIN"
        endpoint = ${c3dp.cdsm.srdc-base}"neuropathic-pain"
        prefetch = "conditions[t2d]"
        required = ""
        diseases = "t2d"
        hlg = "COMP-MAN"
    }
    {
        id = "REM_QRISK2"
        endpoint = ${c3dp.cdsm.srdc-base}"qrisk2"
        #endpoint = ${c3dp.cdsm.gdl-base}"qrisk2?token=${c3dp.cdsm.token}
        prefetch =
"conditions[t1d;t2d;ckd;atrial_fibrillation;rheumatoid_arthritis]
medications[antihypertensives;diuretics;beta_blocking_agents;calcium_channel_bloc
kers;renin_angiotensin] vital_signs[height;weight;bp]

```

```

lab_results[cholesterol;hdl] family_history[family_heart_attack;family_angina]
social_history[smoking]"

    required = "vital_signs[height;weight;bp] lab_results[cholesterol;hdl]"
    diseases = "t2d"
}
{
    id = "REM_GLUCOSE_SELF_MONITORING"
    endpoint = ${c3dp.cdsm.srdc-base}"self-monitoring"
    prefetch = "conditions[t2d]"
    required = ""
    diseases = "t2d"
    hlg = "GLUC-MAN"
}
{
    id = "REM_DEPRESSION_ASSESSMENT"
    endpoint = ${c3dp.cdsm.srdc-base}"suspected-depression"
    prefetch = "conditions[t2d,hf,ckd,dp]"
    required = ""
    diseases = "t2d,hf,ckd"
    hlg = "COMP-MAN"
}

# This is for testing of overrides functionality only
#{
    #id = "CKD_BP_MANAGEMENT"
    #endpoint = ${c3dp.cdsm.srdc-base}"blood-pressure"
    #endpoint = ${c3dp.cdsm.gdl-base}"ckd-bp-
management?token=${c3dp.cdsm.token}

    #prefetch = "conditions[hypertension;t2d;micro_vascular;cardiovascular]
medications[ace_inhibitors;a2_blocker;calcium_channel_blockers;renin_angiotensin;
diuretics] allergies[ace_allergy] lab_results[albumin_level] vital_signs[bp]"

    #required = ""
    #diseases = "ckd"
    #hlg = "BP-MAN"
    # overrides = "REM_BP_MANAGEMENT"
#}
{
    id = "CKD_REFERRAL"
    endpoint = ${c3dp.cdsm.gdl-base}"ckd-referral?token=${c3dp.cdsm.token}

```



```

        prefetch = "conditions[ckd;t2d;umh;renal_outflow_obstruction]
medications[thiazide_diuretics;hypoglycemia_risk]
lab_results[egfr;albumin_creatinine]"

        required = ""
        diseases = "ckd"
        hlg = "RENAL-MAN"
    }
    {
        id = "CKD_GFR_MONITORING"
        endpoint = ${c3dp.cdsm.gdl-base}"ckd-gfr-
monitoring?token=${c3dp.cdsm.token}

        prefetch = "conditions[ckd;t2d;dm] lab_results[egfr;albumin_creatinine]"
        required = ""
        diseases = "ckd"
        hlg = "RENAL-MAN"
    }
    {
        id = "CKD_CVD_PREVENTION_TREATMENT"
        endpoint = ${c3dp.cdsm.gdl-base}"ckd-cvd-prevention-
treatment?token=${c3dp.cdsm.token}

        prefetch =
"conditions[ckd;cardiovascular;atrial_fibrillation;transient_ischemic_attack;hype
rtension;dm;cva;chf]
medications[anti_platelet;atorvastatin;apixaban;simvastatine;pravastatin]
lab_results[egfr]"
        required = ""
        diseases = "ckd"
        hlg = "RENAL-MAN"
    }
    {
        id = "DEPRESSION_PSYCHOLOGICAL_TREATMENT"
        endpoint = ${c3dp.cdsm.gdl-base}"depression-psychological-
treatment?token=${c3dp.cdsm.token}

        prefetch = "conditions[congestive_hf;mild_dp] procedures[cbt;ipt]"
        required = ""
        diseases = "dp"
        hlg = "DP-MAN"
    }
    {
        id = "DEPRESSION_ANTIDEPRESSANT_TREATMENT"

```

```

        endpoint = ${c3dp.cdsm.gdl-base}"depression-antidepressant-
treatment?token=${c3dp.cdsm.token}

        prefetch = "conditions[mild_dp] medications[antidepressants]"
        required = ""
        diseases = "dp"
        hlg = "DP-MAN"
    }
    {
        id = "HF_STABILITY_REVIEW"
        endpoint = ${c3dp.cdsm.gdl-base}"chf-stability-
review?token=${c3dp.cdsm.token}

        prefetch = "conditions[congestive_hf;mild_dp]"
        required = ""
        diseases = "hf"
        hlg = "HF-MAN"
    }
    {
        id = "HF_VACCINATION_RECOMMENDATION"
        endpoint = ${c3dp.cdsm.gdl-base}"chf-vaccination-
recommendation?token=${c3dp.cdsm.token}

        prefetch = "conditions[congestive_hf]
immunizations[influenza_vaccines;pneumococcal_vaccines]"
        required = ""
        diseases = "hf"
        hlg = "HF-MAN"
    }
    {
        id = "HF_FLUID_OVERLOAD"
        endpoint = ${c3dp.cdsm.gdl-base}"chf-fluid-
overload?token=${c3dp.cdsm.token}

        prefetch = "conditions[congestive_hf;fluid_overload]
medications[diuretics]"
        required = ""
        diseases = "hf"
        hlg = "HF-MAN"
    }
    {
        id = "HF_TREATMENT"
        endpoint = ${c3dp.cdsm.gdl-base}"chf-treatment?token=${c3dp.cdsm.token}

```

```

        prefetch = "conditions[congestive_hf]
medications[ace_inhibitors;a2_blocker;beta_blocking_agents]
allergies[ace_allergy;a2_allergy;beta_blocker_allergy]"

        required = ""
        diseases = "hf"
        hlg = "HF-MAN"
    }
    {
        id = "DRUG_INTERACTION"

        #endpoint = ${c3dp.cdsm.srdc-base}"drug-interaction"
        endpoint = ${c3dp.cdsm.gdl-base}"drug-
interaction?token=${c3dp.cdsm.token}"

        prefetch = "conditions[steatosis_of_liver;cough;congestive_hf]
medications[cardiac_therapy;tramadol;a2_blocker;ace_inhibitors;antidepressants;an
tihypertensives;beta_blocking_agents;canagliflozin;dapagliflozin;diuretics;dpp4;e
mpagliflozin;hypoglycemia_risk;pioglitazone] lab_results[egfr]
vital_signs[weight;height]"

        required = ""
        diseases = ""
        hlg = ""
    }
]
}

disease-profile {
    base-folder = null
    filename {
        holistic = "holistic_profile.json"
    }
}
}

```

3. **conf/:** This folder is bound to the Docker container via “/c3c/conf/” and contains the HL7 FHIR specific definitions. It is not necessary to modify any of these definition files under normal circumstances.
4. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 15 – deploy.sh OR deploy.bat

```

docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/repo
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d

```

5. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 16 – destroy.sh OR destroy.bat

```
docker-compose -f docker-compose-swft.yml -p c3cloud_test down
```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

MongoDB Database Container

This official MongoDB Docker image (version 4.0) is used. Since some pilot sites are not able to access Docker official images library, mongo Docker image is put as is into the Osakidetza Docker registry and pulled from there into all three pilot sites. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/mongo:4.0**.

There is not much to configure for mongodb. The **repo-mongo** sub-folder of the Docker containers root folder contains the following three files:

1. **docker-compose.yml:** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used, the port binding from the host to the Docker container (27017 default mongodb port in the container <-> 6006 in the host for staging), and the storage volume to be used by the database. There is a difference in usage of volume between Linux and Windows servers as shown in the scripts below. In Linux servers, **data/db** folder is created in the same folder and bound to the Docker container, while in Windows servers this folder binding does not work for write operations, so a Docker volume titled **repomongodb** is created and used in Windows server. In both cases, no data is stored inside the Docker container. Even if the Docker container is deleted, the data will be safe.

Script 17 – docker-compose.yml [in Linux server, i.e. BC and RJH]

```
version: '2.0'
services:
  repo_mongo:
    image: docker-registry-c3cloud.osakidetza.eus/mongo:4.0
    ports:
      - "6006:27017"
    volumes:
      - ./data/db:/data/db
    restart: always
```

Script 18 – docker-compose.yml [in Windows server, i.e. SWFT]

```
version: '2.0'
volumes:
  repomongodb:
```

```

services:
  repo_mongo:
    image: docker-registry-c3cloud.osakidetza.eus/mongo:4.0
    ports:
      - "6006:27017"
    volumes:
      - 'repomongodb:/data/db'
    restart: always

```

2. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 19 – deploy.sh OR deploy.bat

```

docker pull docker-registry-c3cloud.osakidetza.eus/mongo:4.0
docker-compose -f docker-compose.yml -p c3cloud_test up -d

```

3. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 20 – destroy.sh OR destroy.bat

```

docker-compose -f docker-compose.yml -p c3cloud_test down

```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

Starting and stopping the service

A brand new execution of the Docker containers explained in this document is done via executing the **deploy.sh OR deploy.bat** script in the corresponding setup folder.

Once a Docker container is created from the corresponding Docker image and run by the docker-compose command inside the deploy script, it can be stopped by **docker stop <container_name>** command, and once stopped, it can be started again by **docker start <container_name>** command.

In order to completely stop and remove a Docker container, it is necessary to run the **destroy.sh** or **destroy.bat** script in the corresponding setup folder.

Batch processes

There is no batch process in this case.

Monitoring

The actively running Docker containers in a server can be listed via **docker ps** command as shown below. The last column is the container name, e.g. **c3cloud_test_repo_1**. It is recommended to use PowerShell in Windows servers. In Linux servers, a random number can be suffixed to the container name, such as **c3cloud_test_repo_1_421421421**, by docker-compose.

Script 21 – Listing running Docker containers

```
$> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED
STATUS	PORTS	NAMES	
aa47440afad8 weeks ago	docker-registry-c3cloud.osakidetza.eus/c3cloud/repo Up 3 weeks	"/build/docker-entry..." 0.0.0.0:6005->8080/tcp c3cloud_test_repo_1	3
eebc489efc71 months ago	docker-registry-c3cloud.osakidetza.eus/mongo:4.0 Up 4 weeks	"docker-entrypoint.s..." 0.0.0.0:6006->27017/tcp c3cloud_test_repo_mongo_1	3

The logs can be accessed by using the **docker logs <container_name>** command. The log file can be quite long after some up time, so it is recommended to jump to the most recent logs, e.g. to the last 100 lines via **docker logs --tail 100 <container_name>** command. Logs are quite verbose, so when there is a problem with the repository, the first place to check would be the logs for a possible exception. An example log output is provided below.

Script 22 – Checking logs of FHIR Repository

```
$> docker logs --tail 100 c3cloud_test_repo_1
```

```
.....
10:03:22.747 [ForkJoinPool-2-worker-1] DEBUG AuditManager - Creating an audit record for request
FHIRRequest(urn:uuid:744fe4cb-a8e7-4659-91fe-
c8d9126dc2b8,update,http://c3cloud.swft.nhs.uk/fhir/Observation/3c670b96-8657-4fe7-bc48-b4352a2b5284-
A0001-pinned-pd,Some(Observation),Some(3c670b96-8657-4fe7-bc48-b4352a2b5284-A0001-pinned-
pd),None,None,None,Some(Map(resourceType -> Observation, id -> 3c670b96-8657-4fe7-bc48-b4352a2b5284-
A0001-pinned-pd, status -> final, code -> Map(coding -> List(Map(system -> http://www.c3-
cloud.eu/fhir/ValueSet/user-settings, code -> pinned-patient-data))), subject -> Map(reference ->
Patient/A0001, display -> Patient A0001), performer -> List(Map(reference -> Practitioner/3c670b96-8657-
4fe7-bc48-b4352a2b5284, display -> Anna AnnaAnna)), component -> List(Map(code -> Map(coding ->
List(Map(system -> http://loinc.org, code -> 29463-7, display -> Weight))), Map(code -> Map(coding ->
List(Map(system -> http://loinc.org, code -> 85354-9, display -> Blood pressure panel))), Map(code ->
Map(coding -> List(Map(system -> http://loinc.org, code -> 39156-5, display -> BMI))))), meta ->
Map(versionId -> 1, lastUpdated -> 2019-01-28T10:03:22Z), current -> true, _method -> PUT, _score ->
201),Map(),Map(),None,None,None,None,None,None,Set(),List(),List(),List(),true) ...
10:03:22.751 [ForkJoinPool-2-worker-1] DEBUG FHIRCreateService - Performing a 'create' for AuditEvent...
10:03:22.764 [ForkJoinPool-2-worker-1] DEBUG FHIRCreateService - resource created ...
10:03:22.764 [ForkJoinPool-2-worker-15] DEBUG AuditManager - Audit successfully stored
10:03:22.765 [ForkJoinPool-2-worker-13] DEBUG FHIRCreateService - resource created ...
10:03:22.765 [ForkJoinPool-2-worker-13] DEBUG AuditManager - Audit successfully stored
```

3. RESOLUTION OF INCIDENTS

General platform problems

Common problems that can be observed during piloting can be listed as follows:

1. FHIR Repository Server cannot access MongoDB. Either the mongodb container is down or there is a network problem. The logs will tell if it is not possible to reach the DB.
2. FHIR Repository Server cannot access SPS. Either SPS container is down or there is a network problem. The logs will tell if it is not possible to reach the SPS.
3. FHIR Repository Server cannot access CDS service(s). Either CDS service container(s) are down or there is a network problem or there is another problem related with the content (i.e. the service is reachable but returns an error or throws an exception). The logs will tell if it is not possible to reach a CDS service.
4. FHIR Repository Server cannot access SIS Terminology Mapping Service. Either SIS service is down or there is a network problem or there is another problem related with the content (i.e. the service is reachable but returns an error or throws an exception). The logs will tell if it is not possible to reach the SIS service.

4. APPLICATION OPERATIONS

Deployment of new version

By default, SRDC deploy scripts and docker-compose files check for the latest version of a Docker image in the staging environment (except for mongodb and redis), so when there is a new version published by SRDC, it is enough to execute destroy and deploy scripts consequently. But in production environment, it would be better to fix the version numbers of all Docker containers in the scripts, so that when there is a new version, it would be necessary to update the deploy script and the docker-compose file.

As an example, assume that c3cloud/repo had version 2.0 and now there is a new version 2.1. It needs to be updated. The following steps should be followed:

1. First step is going into the repo folder and executing destroy.sh OR destroy.bat.
2. Then, it is necessary to update the docker-compose.yml file as follows:

Script 23 – Update docker-compose.yml for new version

```
services:
  repo:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/repo:2.1
    environment:
  ...
```

3. The deploy script should be updated as well to pull the latest image from the Docker registry:

Script 24 – Update deploy.sh OR deploy.bat for new version

```
docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/repo:2.1
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d
```

4. Lastly, the Docker container shall be created with the new image version by running deploy.sh OR deploy.bat.

Uninstall and revert to previous version

For uninstalling a Docker container, the only thing needed is to run the destroy.sh OR destroy.bat script in the corresponding Docker setup folder.

For reverting to a previous version, the same steps explained in the previous section shall be followed. The only difference is that, the version number should not be increased, but decreased.

Appendix 18 - C3-Cloud Clinical Decision Support (CDS) component Technical User Manual

This technical user manual is part of the reference documentation for the Clinical Decision Support (CDS) component. It addresses the needs of local IT Teams and System Administrators in understanding, and providing first line support for the CDS component.

1. DESCRIPTION OF THE INFORMATION SYSTEM

Definition and objectives

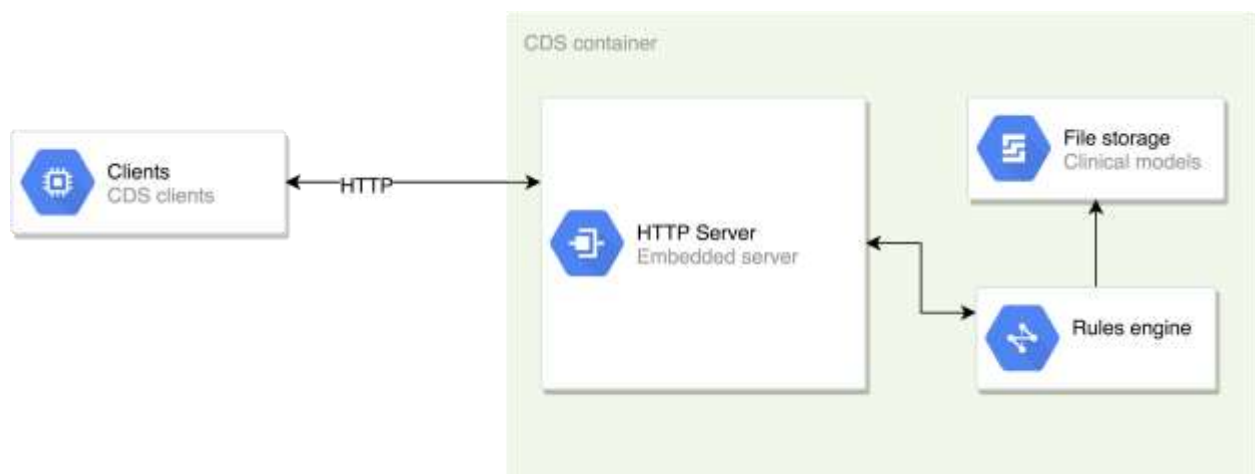
The CDS component provides automated and real-time recommendations for the management of patients with multi-morbidity, relying on evidence-based clinical practice guidelines for diabetes, heart failure, renal failure and depression.

Creating a patient care plan in the local EHR triggers the **careplan-create** CDS hook and results in the prefetch of patient data which is dynamically sent to all listening CDS services. If the prefetch data matches defined conditions in a guideline deployed as a part of the CDS platform, the relevant service returns recommendations in the form of one or several CDS Hooks cards. These cards either display informational messages, or offer suggestions to create or delete one or more FHIR resource instances that make up the patient's medical record.

List of applications

The CDS component consists of several standalone services and microservices, all combined into one Docker image. Chief among these components are the GDL2 guidelines (clinical models) and the GDL2 rules engine.

They are both based on the second version of the Guideline Definition Language (GDL2) specification.



Guidelines

The GDL2 guidelines are computable JSON artefacts that contain the clinical and decision logic derived from evidence-based practice guidelines.

Rules engine

The GDL2 engine is a Java based library that evaluates the conditions and expressions in the computable guidelines as well as validates and executes the guideline logic they contain.

2. OPERATION

Starting and stopping the service

To start the service:

```
docker run -p 80:8080 -e JAVA_OPTS=-Dkeycloak.enabled=false cdsplatform/c3cloud:0.3.9
```

To stop the service:

Run **docker ps** in order to identify the container id.

Then, run **docker stop “container-id”**

Running the service in the background:

```
docker run -e JAVA_OPTS=-Dkeycloak.enabled=false -p 80:8080 -d --restart always cdsplatform/c3cloud:0.3.9
```

Batch processes

None

Monitoring

The service exposes an endpoint that can be used to check its health i.e. <http://localhost/actuator/health> assuming the service is listening on port 80.

The endpoint should respond with {"status": "UP"}.

3. INCIDENT RESOLUTION

General platform problems

In the event of any issue with a CDS service that is not resolved after basic troubleshooting, ideal will be to send problematic data (after anonymisation) to manuel.palacio@cambio.se.

It will also be useful to check the docker container logs to identify specific error messages.

To track the logs of the docker container,

- Run **docker ps** to identify the container id.
- Run **docker logs --follow \$CONTAINER_ID**

To see the latest entries use:

```
docker logs -t --tail 10 ${CONTAINER_ID}
```

4. APPLICATION OPERATIONS

Deployment of new version

New versions will be published to the OSAKIDETZA private docker registry.

To deploy the new version,

- Stop the service as described in *Starting and stopping the service* section.
- Remove the container:
Run **docker rm \$CONTAINER_ID**
- Run the service as described in *Starting and stopping the service* section making sure to specify the new version number.

Uninstall and revert to previous version

Docker retains downloaded images unless explicitly deleted. To revert to a previous version,

- Stop the service as described in *Starting and stopping the service* section.
- Run the service as described in *Starting and stopping the service* section making sure to specify the previous version number.

Appendix 19 - C3-Cloud Coordinated Care and Cure Delivery Platform (C3DP) Technical User Manual

1. DESCRIPTION OF THE INFORMATION SYSTEM

Definition and objectives

The Collaborative Care and Cure Delivery Platform (C3DP) is the Web application for collaborative and personalized care plan management by the members of a multidisciplinary team of care (MDT). In the C3-Cloud architecture, C3DP sits at the top of the hierarchy and is indeed directly integrated with all the other C3-Cloud software components and indirectly with the local EHR/EMR systems of the pilot sites. All the patient data required for care planning is fetched from the C3-Cloud FHIR Repository, which is continuously fed with existing EHR data of the pilot sites via TIS and SIS. Patient provided data via PEP is also stored within the C3-Cloud FHIR Repository. C3DP visualizes this data and helps the health professionals to easily manage the integrated care coordination process for multi-morbid elderly patients, with the support of Clinical Decision Support (CDS) services automating the recommendations from the evidence-based clinical guidelines. This process is formalized as a FHIR CarePlan resource, which consists of building blocks like “Goal” and different types of “Activity” resources.

The main functionalities enabled by C3DP can be summarised as follows:

- Review of patient medical summary
- Cross-check of all patient data that are needed as input by the Clinical Decision Support (CDS) services
- Management of the care plan building blocks; goals, activities and education materials
- “Execution” of a care plan
- Management of the care team
- Communication among care team members and with the patient / informal care giver
- Dashboard view
- Patient provided data view
- Activity calendar
- Real-time system notifications
- Administration functionalities for the pilot site coordinators

Further details regarding C3DP can be found in C3-Cloud deliverables D7.4 - C3-Cloud Coordinated Care and Cure Delivery Platform and D7.3 - Personalised Care Plan Development Platform.

List of applications

C3DP is decomposed into the following deployable artefacts, all of which are packed as a Docker image:

- **C3DP Web App:** C3DP Web Application is the main end-user interfacing component that enables users to manage the care plans of their patients. It is a rich client-side Web application implemented with Angular framework. It depends on some external packages like ng-fhir as a

FHIR client and Socket.IO as a client to subscribe to events from the C3DP Event API. Semantic UI is preferred as the CSS design framework. Responsive design principle is followed to support not only large screens of computers, but also screen sizes of tablets. A clean object-oriented model of the care plan and corresponding resources like conditions, observations, goals, activities, etc., is being maintained in Typescript. Angular framework and the external packages are kept up-to-date to prevent any conflict. The Docker image is based on nginx:alpine image.

- **C3DP Event API:** It provides real-time notifications to inform users or the system itself. It is implemented with Node.js using Express web application framework as REST API and Socket.IO for real-time notifications. Clients (C3DP Web App or PEP) subscribe to the events by sending a subscribe event to the Socket.IO server in the Event API. When a new event occurs like creating or updating a care plan, the client sends the details of this event to the C3DP Event API and the request is handled by Express routes. Then, C3DP Event API makes the necessary operations and notifies the subscribed clients back via Socket.IO and stores the notifications in the C3-Cloud FHIR Repository. C3DP Event API has also an endpoint to handle events related to PEP. The Docker image is based on node:alpine image.
- **Complementary CDS Services:** During the design phase of the CDS services, it has been observed that some CDS suggestions are static and do not directly depend on the clinical status of the patient, unlike most other CDS services. At first, it was decided to embed such suggestions into the C3DP Web App directly, but later this duality between CDS services has become harder to manage. Therefore, these static CDS services have also been implemented by SRDC as REST services compliant with the CDS Hooks specification, similar to the other GDL2 based services. The full list of these services is provided below:
 - DM Self-monitoring of Blood Glucose
 - DM Management of Gastroparesis
 - DM Management of Neuropathic Pain
 - DM Management of Autonomic Neuropathy
 - DM Management of Erectile Dysfunction
 - DM Management of Eye Disease
 - CKD Self-management
 - CKD Lifestyle and Dietary Advice
 - Screening assessment of suspected depression
 - Patient Education

They are all implemented with Node.js using Express web application framework. The implementation also includes the full set of Type 2 Diabetes CDS services, which are implemented by SRDC and used for a long time before the full set became available from the GDL2 based implementation. The Docker image of this artefact is based on node:alpine image.

2. OPERATION

Configuration

The configuration files and execution scripts of three Docker containers of C3DP are presented in the following sub-sections.

C3DP Web App Container

The Docker image of C3-Cloud FHIR Repository Server is built and published by SRDC. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-<PILOT-SITE>**. Unlike the other 6 Docker images provided by SRDC, there is one Docker image for C3DP per pilot site since several REST API connection parameters are provided at build time to the C3DP Angular application. So, the suffix of the Docker image is either **c3cloud/c3dp-bc** or **c3cloud/c3dp-rjh** or **c3cloud/c3dp-swft**.

The **c3dp** sub-folder of the Docker containers root folder contains the following configuration files and folder:

1. **docker-compose.yml (docker-compose-bc.yml OR docker-compose-rjh.yml OR docker-compose-swft.yml):** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used, the port binding from the host to the Docker container (80 port in the container <-> 6001 in the host for staging), and lastly the 3 environment variables to be passed to the Docker container:
 - a. **SERVER_NAME:** The domain name of the C3DP that is being deployed. It is required for correct virtual host configuration in the nginx Web server inside the Docker container.
 - b. **SERVER_PATH_SUFFIX:** The URL suffix of the C3DP that is being deployed.
 - c. **DOCKER_CONTAINER_HOST:** The name of the Docker container that is containing the C3DP. It is always 'c3dp' in our case. It might be needed for correct virtual host configuration in the nginx Web server inside the Docker container.

Script 25 – docker-compose.yml

```
version: '2.0'

services:
  c3dp:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-swft
    environment:
      - SERVER_NAME=c3cloud.swft.nhs.uk
      - SERVER_PATH_SUFFIX=test/c3dp
      - DOCKER_CONTAINER_HOST=c3dp
    ports:
      - "6001:80"
    restart: always
```

2. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 26 – deploy.sh OR deploy.bat

```
docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-swft
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d
```

3. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 27 – destroy.sh OR destroy.bat

```
docker-compose -f docker-compose-swft.yml -p c3cloud_test down
```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

C3DP Event API Container

The Docker image of C3-Cloud Event API is built and published by SRDC. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/c3cloud/event-api**.

The **c3dp-event** sub-folder of the Docker containers root folder contains the following four files:

1. **docker-compose.yml (docker-compose-bc.yml OR docker-compose-rjh.yml OR docker-compose-swft.yml):** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used, the port binding from the host to the Docker container (2000 port in the container <-> 6002 in the host for staging), the binding of the current folder in the host to the Docker container as “/config” for passing the application configuration file and lastly an environment variable to be passed to the Docker container:
 - a. **APP_CONF_FILE:** The path to the configuration file of the C3DP Event API. The content is explained in the next item.

Script 28 – docker-compose.yml

```
version: '2.0'
services:
  event_api:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/event-api
    environment:
      - APP_CONF_FILE=/config/config.swft.json
    ports:
      - "6002:2000"
    volumes:
      - .:/config
    restart: always
```

2. **config.json (config.bc.json OR config.rjh.json OR config.swft.json):** Configuration file of C3DP Event API. The important parameters that might need to be updated can be listed as follows:
 - a. **auth:** A Boolean value indicating whether the Event API should authenticate to the FHIR Repository by acquiring an access token from SPS.
 - b. **fhir:** Contains the endpoint information of the C3-Cloud FHIR Repository. It needs to be updated accordingly for the production environment.
 - c. **authApi:** Contains the endpoint information of the SPS Server API. It needs to be updated accordingly for the production environment.

- d. **authClient:** Contains the OAuth 2.0 client configuration parameters (client id and client secret) for the C3DP Event API that is provided by SPS and is needed for acquiring a valid access token from SPS to be provided to FHIR Repository for accessing patient data. It needs to be updated accordingly for the production environment.
- e. **pep:**
 - i. **eventListenerEndpoint:** Contains the URL of the PEP Event API, since there is two-way event exchange between C3DP Event API and PEP Event API. It needs to be updated accordingly for the production environment.
 - ii. **applicationId:** The application id assigned to C3DP Event API by PEP for accessing PEP Event API (i.e. like a username). It needs to be updated accordingly for the production environment.
 - iii. **sharedSecret:** The application secret assigned to C3DP Event API by PEP for accessing PEP Event API (i.e. like a password). It needs to be updated accordingly for the production environment.
- f. **port:** The HTTP port at which the C3DP Event API is served inside the Docker container.
- g. **language:** Two-character language code (en, se, sv) according to pilot site.

Script 29 – deploy.sh OR deploy.bat

```
{
  "auth": true,
  "fhir": {
    "protocol": "https",
    "hostname": "c3cloud.swft.nhs.uk",
    "port": 443,
    "path": "/test/fhir/",
    "headers": {
      "Content-Type": "application/json+fhir; charset=UTF-8"
    }
  },
  "authApi": {
    "protocol": "https",
    "hostname": "c3cloud.swft.nhs.uk",
    "port": 443,
    "path": "/test/onaut/api/"
  },
  "authClient": {
    "client_id": "event-api",
    "client_secret": "SECRET",
    "client_configuration_token": "TOKEN"
  },
  "pep": {
```



```

    "eventListenerEndpoint": {
        "hostname": "stagec3pepweb.swft.nhs.uk",
        "path": "/api/v1/EventListener"
    },
    "applicationId": "PEP-C3DP-APP-ID",
    "sharedSecret": "SHARED-SECRET"
},
"port": 2000,
"language": "en"
}

```

3. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 30 – deploy.sh OR deploy.bat

```

docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/event-api
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d

```

4. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 31 – destroy.sh OR destroy.bat

```

docker-compose -f docker-compose.yml -p c3cloud_test down

```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

Complementary CDS Services Container

The Docker image of Complementary CDS Services is built and published by SRDC. The name of the Docker image is **docker-registry-c3cloud.osakidetza.eus/c3cloud/cds**.

There is not much to configure for Complementary CDS Services. The **c3dp-cds** sub-folder of the Docker containers root folder contains the following configuration files and folder:

1. **docker-compose.yml:** Configuration file that is used by docker-compose to start or stop & remove the Docker container based on the Docker image. It states the Docker image to be used and the port binding from the host to the Docker container (3000 port in the container <-> 6003 in the host for staging).

Script 32 – docker-compose.yml

```

version: '2.0'

services:
    srdc_cds:

```

```

    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/cds
    ports:
      - "6003:3000"
    restart: always

```

2. **deploy.sh OR deploy.bat:** Execution script using **docker pull** to pull the Docker image from the registry and then execute it via **docker-compose**. **c3cloud_test** is the prefix for the name of the container to be executed and will be replaced with **c3cloud** in production.

Script 33 – deploy.sh OR deploy.bat

```

docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/cds
docker-compose -f docker-compose.yml -p c3cloud_test up -d

```

3. **destroy.sh OR destroy.bat:** Execution script using **docker-compose** to stop and remove the Docker container. Again, **c3cloud_test** prefix will be replaced with **c3cloud** in production.

Script 34 – destroy.sh OR destroy.bat

```

docker-compose -f docker-compose.yml -p c3cloud_test down

```

Note: It might be necessary append a **sudo** command at the beginning of each command in deploy and destroy scripts in Linux servers depending on user permissions.

Starting and stopping the service

A brand new execution of the Docker containers explained in this document is done via executing the **deploy.sh OR deploy.bat** script in the corresponding setup folder.

Once a Docker container is created from the corresponding Docker image and run by the **docker-compose** command inside the deploy script, it can be stopped by **docker stop <container_name>** command, and once stopped, it can be started again by **docker start <container_name>** command.

In order to completely stop and remove a Docker container, it is necessary to run the **destroy.sh** or **destroy.bat** script in the corresponding setup folder.

Batch processes

There is no batch process in this case.

Monitoring

The actively running Docker containers in a server can be listed via **docker ps** command as shown below. The last column is the container name, i.e. **c3cloud_test_c3dp_1**, **c3cloud_test_event_api_1** and **c3cloud_test_srhc_cds_1** in this case. It is recommended to use PowerShell in Windows servers.

In Linux servers, a random number can be suffixed to the container name, such as `c3cloud_test_c3dp_1_421421421`, by `docker-compose`.

Script 35 – Listing running Docker containers

```
$> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED
STATUS	PORTS	NAMES	
4b2f9545ea33	docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-swft	"/c3dp/docker-entryp..."	3
days ago	Up 3 days	0.0.0.0:6001->80/tcp	c3cloud_test_c3dp_1
6d4744220728	docker-registry-c3cloud.osakidetza.eus/c3cloud/event-api	"/bin/sh -c 'node se..."	3
weeks ago	Up 3 weeks	0.0.0.0:6002->2000/tcp	c3cloud_test_event_api_1
265a6766805d	docker-registry-c3cloud.osakidetza.eus/c3cloud/cds	"/bin/sh -c 'npm sta..."	3
weeks ago	Up 3 weeks	0.0.0.0:6003->3000/tcp	c3cloud_test_srdc_cds_1

The application logs from the Docker container can be accessed by using the `docker logs <container_name>` command. The log file can be quite long after some up time, so it is recommended to jump to the most recent logs, e.g. to the last 100 lines via `docker logs --tail 100 <container_name>` command.

When there is a problem with the C3DP Web App, the first place to check in fact is not the application logs from the Docker container, but the console output and network traffic of the Web browser, which can be accessed by pressing F12 in all modern Web browsers.

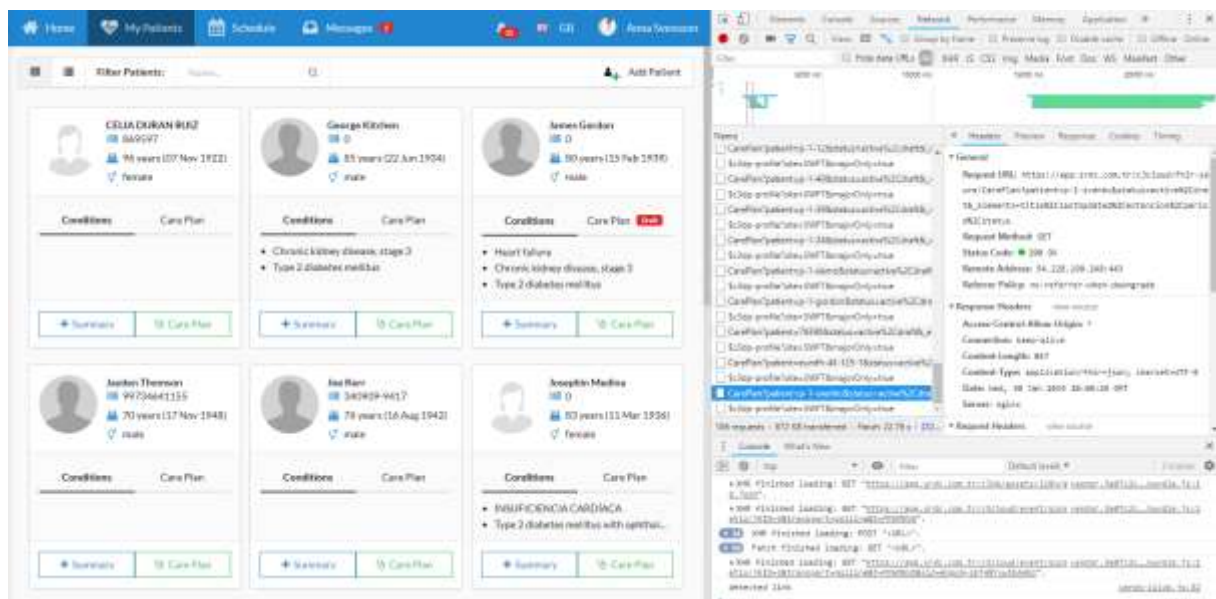


Figure 160 Checking console output and network traffic of C3DP Web App via Web Browser

Only in very rare cases, it might be necessary to check the logs of the nginx web server inside the Docker Container that is hosting the C3DP Web App. An example output is provided below:

Script 36 – Checking logs of Nginx hosting the C3DP Web App in the Docker Container

```
$> docker logs --tail 100 c3cloud_test_c3dp_1
```

```
.....
```

```
172.18.0.1 - - [30/Jan/2019:11:04:37 +0000] "GET /test/c3dp/0.6be1c5b11a45631638ef.chunk.js HTTP/1.0"
200 389475 "https://c3cloud.swft.nhs.uk/test/c3dp/patient/A0001/careplans/665ee3f6-1245-4b6e-acfb-a5aabb2e148d" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)
Chrome/71.0.3578.98 Safari/537.36" "-"
```

```
172.18.0.1 - - [30/Jan/2019:11:04:37 +0000] "GET /test/c3dp/1.64b61daf3b90981e2bb2.chunk.js HTTP/1.0"
```

```

200 1352007 "https://c3cloud.swft.nhs.uk/test/c3dp/patient/A0001/careplans/665ee3f6-1245-4b6e-acfb-a5aabb2e148d" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

172.18.0.1 - - [30/Jan/2019:11:04:37 +0000] "GET /test/c3dp/flags.9c74e172f87984c48ddf.png HTTP/1.0" 200 28123 "https://c3cloud.swft.nhs.uk/test/c3dp/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

172.18.0.1 - - [30/Jan/2019:11:04:38 +0000] "GET /test/c3dp/assets/i18n/gb.json HTTP/1.0" 200 26213 "https://c3cloud.swft.nhs.uk/test/c3dp/patient/A0001/careplans/665ee3f6-1245-4b6e-acfb-a5aabb2e148d" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

172.18.0.1 - - [30/Jan/2019:11:04:38 +0000] "GET /test/c3dp/favicon.ico HTTP/1.0" 200 15086 "https://c3cloud.swft.nhs.uk/test/c3dp/patient/A0001/careplans/665ee3f6-1245-4b6e-acfb-a5aabb2e148d" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

172.18.0.1 - - [30/Jan/2019:11:04:38 +0000] "GET /test/c3dp/favicon.ico HTTP/1.0" 200 15086 "https://c3cloud.swft.nhs.uk/test/c3dp/patient/A0001/careplans/665ee3f6-1245-4b6e-acfb-a5aabb2e148d" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

172.18.0.1 - - [30/Jan/2019:14:23:21 +0000] "GET /test/c3dp/dxicons.fecefa653dc2b75bc3fb.woff HTTP/1.0" 200 20016 "https://c3cloud.swft.nhs.uk/test/c3dp/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" "-"

```

The logs of the C3DP Event API can be checked again via the **docker logs** command. An example output is provided below:

Script 37 – Checking logs of C3DP Event API

```

$> docker logs --tail 100 c3cloud_test_event_api_1

.....

2019-01-30T10:37:14.944Z [FHIR] Created: AuditEvent/022d6ea0-247b-11e9-b623-1130f8f08b90

2019-01-30T10:37:45.541Z [ROUTE] BOTH: POST

2019-01-30T10:37:45.541Z [BOTH] New Request: CareTeamCreated

2019-01-30T10:37:45.632Z [FHIR] Created: Communication/7cb972a5-149c-43bd-b79d-eabb82b62976

2019-01-30T10:38:15.956Z [PEP-API] EventsPushed: 1 Event(s) sent to PEP

2019-01-30T10:41:06.682Z [ROUTE] EVENT-QUEUE [Practit PUT

2019-01-30T10:41:35.959Z [ROUTE] EVENT-QUEUE [Practit PUT

2019-01-30T10:43:36.143Z [ROUTE] EVENT-QUEUE [Practit PUT

2019-01-30T10:43:58.846Z [SOCKET] Disconnected: Practitioner/swft-beach

2019-01-30T10:43:58.916Z [FHIR] Created: AuditEvent/f307c1e0-247b-11e9-b623-1130f8f08b90

2019-01-30T10:43:58.952Z [FHIR] Created: Observation/f307c1e1-247b-11e9-b623-1130f8f08b90

2019-01-30T11:04:35.448Z [SOCKET] Disconnected: Practitioner/3c670b96-8657-4fe7-bc48-b4352a2b5284

2019-01-30T11:04:36.811Z [FHIR] Created: AuditEvent/d41a6690-247e-11e9-b623-1130f8f08b90

2019-01-30T11:04:36.881Z [FHIR] Created: Observation/d41a6691-247e-11e9-b623-1130f8f08b90

2019-01-30T11:04:38.639Z [SOCKET] Connected: Practitioner/3c670b96-8657-4fe7-bc48-b4352a2b5284

2019-01-30T11:04:39.574Z [FHIR] Created: AuditEvent/d60127f0-247e-11e9-b623-1130f8f08b90

```

The logs of the Complementary CDS Services by SRDC can be checked again via the **docker logs** command. An example output is provided below:

Script 38 – Checking logs of C3DP Event API

```
$> docker logs --tail 100 c3cloud_test_srdc_cds_1
.....
POST /cds/patient-education 200 7.054 ms - 24468
POST /cds/patient-education 200 2.942 ms - 24468
POST /cds/patient-education 200 4.268 ms - 18103
POST /cds/erectile-dysfunction 200 0.633 ms - 19
POST /cds/self-monitoring 200 8.142 ms - 5028
POST /cds/gastroparesis 200 0.846 ms - 6882
POST /cds/neuropathic-pain 200 1.669 ms - 10806
POST /cds/nephropathy 200 0.767 ms - 19
POST /cds/autonomic-neuropathy 200 0.498 ms - 19
POST /cds/eye-disease 200 0.849 ms - 3702
POST /cds/self-monitoring 200 0.894 ms - 5028
POST /cds/gastroparesis 200 2.013 ms - 6882
POST /cds/autonomic-neuropathy 200 0.619 ms - 19
POST /cds/neuropathic-pain 200 1.577 ms - 10806
POST /cds/nephropathy 200 0.633 ms - 19
POST /cds/eye-disease 200 5.387 ms - 3702
POST /cds/patient-education 200 1.618 ms - 18103
POST /cds/erectile-dysfunction 200 0.507 ms - 19
```

3. RESOLUTION OF INCIDENTS

General platform problems

Common problems that can be observed during piloting can be listed as follows:

1. C3DP cannot access C3-Cloud FHIR Repository. Either FHIR Repository container is down or there is a network problem. C3DP Web App UI will indicate that it is trying to establish a connection and further details will be available via console output and network traffic logs of the Web browser.
2. C3DP cannot access SPS for authenticating users or refreshing existing tokens. Either SPS container is down or there is a network problem. Depending on the exact problem, details will be provided either via C3DP Web App or SPS GUI and / or console output and network traffic logs of the Web browser.
3. C3DP cannot get any recommendation from the CDS services. Either CDS service container(s) are down or there is a network problem or there is another problem related with the content (i.e. the service is reachable but returns an error or throws an exception). The network traffic logs of the Web browser will indicate if there is an error in calling a CDS service. The real cause of the problem will be visible in the application logs of the C3-Cloud FHIR Repository since calls to the CDS services are being done server-to-server from the C3-Cloud FHIR Repository. These logs dump the request and response messages for each CDS call.

4. PEP cannot receive the care plan of a patient or C3DP cannot get any data from the patient via PEP. When there is some new data that is of interest to both health professional and patient, depending on the source either C3DP informs PEP via Event API and writes some data into the C3-Cloud FHIR Repository, or PEP informs C3DP via Event API and writes some data in the C3-Cloud FHIR Repository. Hence, when there is a problem in this respect, the exact cause can be in one of these components or the network communication among them. Their applications logs should be checked.

4. APPLICATION OPERATIONS

Deployment of new version

By default, SRDC deploy scripts and docker-compose files check for the latest version of a Docker image in the staging environment (except for mongodb and redis), so when there is a new version published by SRDC, it is enough to execute destroy and deploy scripts consequently. But in production environment, it would be better to fix the version numbers of all Docker containers in the scripts, so that when there is a new version, it would be necessary to update the deploy script and the docker-compose file.

As an example, assume that c3cloud/c3dp-swft had version 2.0 and now there is a new version 2.1. It needs to be updated. The following steps should be followed:

1. First step is going into the **c3dp** folder and executing destroy.sh OR destroy.bat.
2. Then, it is necessary to update the docker-compose.yml file as follows:

Script 39 – Update docker-compose.yml for new version

```
services:
  c3dp:
    image: docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-swft:2.1
    environment:
  ...
```

3. The deploy script should be updated as well to pull the latest image from the Docker registry:

Script 40 – Update deploy.sh OR deploy.bat for new version

```
docker pull docker-registry-c3cloud.osakidetza.eus/c3cloud/c3dp-swft:2.1
docker-compose -f docker-compose-swft.yml -p c3cloud_test up -d
```

4. Lastly, the Docker container shall be created with the new image version by running deploy.sh OR deploy.bat.

Uninstall and revert to previous version

For uninstalling a Docker container, the only thing needed is to run the destroy.sh OR destroy.bat script in the corresponding Docker setup folder.

For reverting to a previous version, the same steps explained in the previous section shall be followed. The only difference is that, the version number should not be increased, but decreased.

Appendix 20 - Training Plan Overview

1. SWFT

TRAINING OBJECTIVE

The approach of the training plan in SWFT is to minimise 1-2-1 interactions (to reflect restrictions on resourcing and also to reflect a real world scenario if the system which rolled out on a large scale) but to ensure that key stakeholders have sufficient knowledge, confidence and practical understanding of both the study and the C3-Cloud system to participate in, or to support, the study effectively.

METHODOLOGY

A training needs analysis was conducted by SWFT and the wider project which looked at:

- (i) categories of users to be trained, i.e. HCPs, Patients, caregivers, technical support staff, system administrators
- (ii) how many users need to be trained
- (iii) what areas the users need to be trained in, e.g. the project itself, the system, the evaluation etc, and to what level they would need to be trained in these areas
- (iv) when they should be trained

As a result, a training plan was developed, as outlined below.

TRAINING APPROACH

• HCPs

The training approach for HCPs has evolved and become more pragmatic over time. As the start of the study has got closer, and in view of the low Patient uptake rate and the reduction in disease severity levels, the approach has been revised. The assumption is that many of the HCPs will see the study Patients infrequently during the study, and as a result, their use of the system will not be regular and they may quickly forget how to use the system. This is reflected in the training approach for the various staff groups below.

– GPs

The inclusion of Patients with less severe cases of the 4 diseases implies that the study Patients are most likely to be treated in primary care. As a result, it is expected that the GPs will be the HCPs that are most actively involved in managing the care plan with the Patient. Therefore, it has been agreed that more intensive training and support will be given to GPs. So far, they have received the following training:-

- Initial discussions about the project
- Project Information Sheet for HCPs
- C3DP & PEP demos as the system has evolved to gradually introduce the system concepts/functions at a high level

Further training will be delivered as follows:-

- Once the live C3DP system is ready and the Patient details have been loaded and checked, a member of the project team will sit with each GP to check the records of their Patients. This will include e.g. checking the demographics, the medical summary and the datasets underpinning CDS. At this point they will be issued with their system logins and 1-2-1 training will be given on how to use the functions in the system. The care plan will not be created at this stage. At the end of the session, they will also be given the following training materials to encourage more self-directed learning:-
 - Project Guide Book for HCPs
 - C3DP User Manual
 - URL to the C3DP video tutorial
 - Consultation Crib Sheet

- At a later stage, each Patient will attend for their care plan preparation appointment with a GP. One or more members of the project team will be based in the practice at these times to offer GPs support and ad hoc guidance.
- Ad hoc support and refresher training will be provided on request.

– **Other HCPs**

It is expected that this group of HCPs are likely to be involved in the study, and use the system, on a less predictable basis. Therefore their training will need to be more pragmatic as they will very quickly forget how to use the system between usage sessions. Included in this category are:-

- Practice Nurses at Rother House
- District Nurses covering the Rother House area
- Dieticians
- Diabetes nurse specialists
- Heart failure nurse specialists

So far, this group has received training as follows:

- Project Information Sheet for HCPs
- Formal system demos in staff groups
-

It has been agreed with these staff groups that they will inform a member of the project team when they are expecting to see one of the Patients in the study, so that they can receive direct 1-2-1 training from a project team member in readiness. If any of these HCPs feel on reviewing the Patient list that they are likely to see the Patients regularly, then they will be given general 1-2-1 training at the start of the study. They will also be given the same training materials as the GP in 3.1.1 above to encourage more self-directed learning.

• **Patients/Caregivers**

So far Patients have been trained as follows:-

- Project Information Sheet for Patients/Care Givers
- Evaluation Summary
- Further information about the project over the telephone with a member of the project team on receipt of a consent to contact form

Originally, it was planned that Patients and their caregivers would next be trained at workshops in groups of 10-20. However, as the number of Patients who have consented to take part is so small, it has now been agreed that Patients/care givers will be trained 1-2-1 by a member of the project team when they attend for their initial GP care plan appointment at the practice. During this session Patients will be talked through a number of slides about the project and the system and will be shown the PEP system. They will also be given the following training materials to encourage more self-directed learning:

- PEP system user manual
- Project Guide Book for Patients/Carers
- Wallet card
- Details of the multi-morbidity video and PEP system video tutorial

• **Technical Support**

Technical support teams have been provided with a technical support manual for each C3-Cloud component. Webexes will be arranged with the technical partners and the local technical support teams to discuss support arrangements and activities in more detail.

NB: all participants can contact the local project contact for help and supplementary training at any time during the study.

2. RJH

• HCPs

Taking into account the inclusion criteria of the C3-Cloud Patients, they are most likely to be treated in primary care.

Training is being delivered as follows:-

- Once the live C3-Cloud system (both C3DP and PEP) is fully operational in RJH environment, HCPs will attend training sessions focused on the “C3-Cloud intervention” in order to learn how to handle the C3-Cloud System (C3DP and PEP).
- Training sessions at 8 healthcare centers have been scheduled by mid-April to mid-May using a demonstration video and a presentation regarding GCP.

HCPs will receive the following training materials:

- Project Information Sheet for HCPs
- Information session where the project and the intervention have been explained
- Initial discussions about the project
- Project Guide Book for HCPs
- C3DP & PEP demos to introduce the system concepts/functions at a high level
- C3DP User Manual
- URL to the C3DP video tutorial

During the intervention, one or more members of the project team will be accessible to offer HCPs support and *ad hoc* guidance. *Ad hoc* support and refresher training will be provided on request.

Provision will need to be made for training new starters, e.g. if an MDT member withdraws from the study and a replacement is found or if a new HCP becomes member of the care team but he/she was not part of the initial group of recruited HCPs and thus he/she has not received the initial training. It is proposed that the new starter is given training by a Super User or from a colleague that is already using the system and is sufficiently proficient to do so. They will be provided with the training materials in the same ways as those that joined the study at the beginning.

• Patients/Caregivers

220 patients have already consented to participate in the intervention.

Patients have been already trained as follows:-

- Project Information Sheet for Patients/Care Givers
- Further information about the project

Beginning of May to middle of May patients will be trained in 4 sessions. Two of them will be video transmitted to remote healthcare centers (up to almost 200 km away) where local personnel is assisting. A video demonstration of the system will be the core element of these sessions. They will also be given the following training materials to encourage more self-directed learning:

- PEP system user manual
- Project Guide Book for Patients/Carers
- Wallet card
- Details of the multi-morbidity video and PEP system video tutorial

• Technical Support

Technical support teams have been provided with technical support manuals for each C3-Cloud component. Webexes will be arranged with the technical partners and the local technical support teams to discuss support arrangements and activities in more detail.

All participants can contact the local project contact for help and supplementary training at any time during the study.

3. BC

• HCPs

Taking into account the inclusion criteria of the C3-Cloud Patients, they are most likely to be treated in primary care. Primary care professionals are expected to be the HCPs that are most actively involved in managing the care plan with the Patient. Osakidetza has recruited 66 GPs and 51 Primary Care nurses from 14 health care centers from 7 Integrated Care Organisations (ICOs). These HCPs have received the following training:

- Project Information Sheet for HCPs
- Information session where the project and the intervention have been explained
- Initial discussions about the project
- Project Guide Book for HCPs
- C3DP & PEP demos to introduce the system concepts/functions at a high level

Further training will be delivered as follows:-

- Once the live C3-Cloud system (both C3DP and PEP) is fully operational in Osakidetza production environment and the “test Patient” (not a real Patient but with realistic data) data is loaded, HCPs will attend a session focused on the “C3-Cloud intervention” in order to learn how to handle the C3-Cloud System (C3DP and PEP). This is a training of trainers sessions gathering at least one HCP per healthcare center. At the end of the session, they will receive training materials to encourage more self-directed learning:-
 - C3DP User Manual
 - URL to the C3DP video tutorial
- Then these professional will have to train their colleagues.
- During the intervention, one or more members of the project team will be accessible to offer HCPs support and *ad hoc* guidance. In addition, a field trial manager has been engaged for C3-Cloud project to be in charge of coordinating and monitoring the study in the Integrated Care Organisations (ICOs) involved. She is a Primary care nurse who is part of the Project Local Team. She will be supporting any aspect of the intervention (reinforcing the training of professionals, solving issues, detecting improvement areas, collecting lessons learned, etc.).
- *Ad hoc* support and refresher training will be provided on request.
- Provision will need to be made for training new starters, e.g. if an MDT member withdraws from the study and a replacement is found or if a new HCP becomes member of the care team but he/she was not part of the initial group of recruited HCPs and thus he/she has not received the initial training. It is proposed that the new starter is given training by a Super User or from a colleague that is already using the system and is sufficiently proficient to do so. They will be provided with the training materials in the same ways as those that joined the study at the beginning.

• Patients/Caregivers

Patients have been trained as follows:-

- Project Information Sheet for Patients/Care Givers
- Further information about the project over the telephone or f-2-f with a HCP

Patients and their caregivers will be trained at workshops in groups per healthcare center. They will be trained by HCPs with the support of the Local Project Team. During this session Patients will be talked through a number of slides about the project and the system and will be shown the PEP system. They will also be given the following training materials to encourage more self-directed learning:

- PEP system user manual
- Project Guide Book for Patients/Carers
- Wallet card
- Details of the multi-morbidity video and PEP system video tutorial

- **Technical Support**

Technical support teams have been provided with technical support manuals for each C3-Cloud component. Webexes will be arranged with the technical partners and the local technical support teams to discuss support arrangements and activities in more detail.

All participants can contact the local project contact for help and supplementary training at any time during the study.