

CARE INFORMATION EXCHANGE

TECHNICAL GUIDANCE

DOCUMENT CONTROL

Revision History			
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TABLE OF CONTENTS

1	Purpose of this document	2
2	Background	2
3	Numbering Strategy	4
4	HL7 Messaging Approach	5
5	REST API	7
6	Account Creation & Single Sign-On	7

1 PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide technical guidance to participating organisations in the CIE project, in particular acute trusts. The document provides a brief summary of the background to the project, an overview of the data CIE is capable of processing and points to the relevant supplier specifications. The paper also provides an overview of the approach to numbering, account creation, and single sign-on from local systems.

The intended audience are system architects, integration leads, project managers, and IT managers.

2 BACKGROUND

2.1 DEPLOYMENT CONTEXT

Imperial College Charity has provided significant funding for a project to create a multi-organisational health record shared across a broad spread of care settings across North West London (NWL). The project is presently known among participating organisations as the Care Information Exchange (CIE).

Participating organisations include acute trusts, GP's, community health trusts, mental health trusts, social care providers and other healthcare organisations involved in direct care such as NHS 111, Co-ordinate My Care, hospices, and charities.

The intention is for as many as possible of the health and social care providers in NWL to contribute to the system to provide an aggregated record against which shared care can be effectively managed. Patients will have access to and control over which organisations have access to which parts of their record. There is also a vision to use the system as a vehicle to orchestrate the maintenance of cross organisational care plans, tasks and other 'communication'.

To this end a number of new interfaces are required to transmit data to the system.

The solution on which the system will be based is a 'patient controlled health record' system called Patients Know Best (PKB).

2.2 PKB SPECIFIC BACKGROUND

PKB provides a consolidated patient centric health record which can be shared by all parties involved in their care. The record is notionally divided into 4 sections; general health, sexual health, mental health, and social care. The patient controls which organisations and individuals can access each of these categories.

The solution provides access to the system via a website capable of serving devices of pretty well all form factors. PKB also support integration with a range of popular 'wellness' and health apps etc. The web site can be switched by the user, 'on the fly', to render pages in a significant number of different languages and provides extensive support for mobile device integration and patient contributed data sets. It also supports secure messaging and video communication channels between patients, carers and clinicians.

The participating organisations are keen to explore how these can be used in support of modern care models etc.

Data from contributing organisations and individuals is consolidated and codified to a single consistent data model. The system supports HL7 messaging inbound as well as exposing a comprehensive REST based API through which apps of all scales can integrate.

The system implements a 'zero knowledge' database with all data being held in encrypted form and hosted in N3 connected data centres.

Supporting documentation for IT departments can be found here: <http://dev.patientsknowbest.com/home/it-department-documentation-about-patients-know-best>

Supporting documentation for IG departments can be found here: <http://dev.patientsknowbest.com/home/legal-documentation-about-patients-know-best>

2.3 SCOPE OF THIS DOCUMENT

Each contributing organisation is responsible for developing its own data feeds to PKB. This document provides an overview of the data CIE is capable of processing.

The full spread of data to be sent to PKB is likely to be developed in at least two phases. This document covers only those areas defined as CIE Phase 1.

Patient Administration activity		CIE Phasing
	Registrations & Demographic updates	Phase 1
	Inpatient ADT (and Undo / correction of)	Phase 1
OP Scheduling activity		
	OP appointment booking, rescheduling, cancellation/DNA etc	Phase 1
	Waiting list activity	Phase 1
Pathology & Radiology Reports		
	Pathology results	Phase 1
	Radiology results	Phase 1
Unstructured Documents		
	Discharge summaries (to GP/Patient)	Phase 1 The documents listed here are illustrative only – organisations may support a wider or more limited set. At the time of writing PKB only support clinic letters and discharge summaries but this is expected to expand as trust capabilities to send other documents develop.
	OP Clinic letters (to GP)	
	Medications note	
	Diagnostic reports	
	Referral letters	
Structured Documents		
	CDA / CCD structured clinical documents	Phase 2
	Structured Care Plans	Phase 2
Structured clinical data		
	Problems & Diagnoses	Phase 2
	Medications (Trust prescribed), Allergies & Contraindications	Phase 2
	Operations & Procedures	Phase 2
	Immunisations	Phase 2

	Observations and Vital Signs	Phase 2
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The detail of those areas defined as Phase 1 is expanded in later sections of this document. Other areas are likely to require further progression of local Trust ICT programmes and will be the subject of further specifications and development phases.

3 NUMBERING STRATEGY

3.1 PATIENT AND ENCOUNTER NUMBERING

3.1.1 PID SEGMENT

Because the CIE is designed to be used across care provider settings, each of which may have their own and potentially several, local numbering schemes, it has been agreed that primary patient identity will be based on the NHS Number. The CIE Numbering Strategy can be found on the CIE website Resources page (<https://www.careinformationexchange-nwl.nhs.uk/resources>).

PKB are investigating the issues around multi-organisational record merging based on local identifiers and may support this in the future – it is not supported at present.

In the meantime, Trust Integration Engines should ensure that all messages contain at least the NHS Number, suitably identified with appropriate Assigning Authority and Identifier Type Code values. **I.e. data will not be sent unless the NHS Number of the patient is known and present on the message.**

Messages intended to create a patient record in PKB, or to update the demographics associated with an existing PKB patient record MUST provide in PID.3.2 of the NHS Number field, the NHS Number Status value of '01', indicating that the quoted NHS Number has been verified against the NHS PDS (Spine). Where messages (eg Pathology/Radiology reports) cannot provide an explicitly verified NHS Number, the NHS Number Status field may be left blank. Such data will still be matched to the patient record on the basis of the NHS Number. PKB will also check an agreed set of demographic fields to provide secondary assurance of an appropriate match.

Other numbers may be included as repeats in PID.3 and it is essential these are also qualified by suitable Assigning Authority and Identifier Type Code values.

This approach means we can proceed with deployment of the feeds without having to support merge messages ahead of PKB completing any developments which might support merging of records across multiple organisations based on local identifiers.

3.1.2 PV1 SEGMENT

Messages carrying Visit / Encounter level detail in the PV1 segment permit PKB to maintain an Encounter data structure. Where data points are related to a specific Encounter, PKB will link them to their Encounter data point. This linking of data points to Encounters and the state of an Encounter at any point in time will be tracked by PKB, using the VisitID (PV1.19) to hold a unique identifier for the Encounter. The VisitID need only be unique within an organisation.

4 HL7 MESSAGING APPROACH

Contributing organisations are expected to adhere to PKB’s message specifications as documented here – <http://dev.patientsknowbest.com/home/hl7-api>

However, PKB have indicated that where organisations perceive issues they are unable to resolve through their Trust Integration Engines, they are prepared to consider where they may be able to resolve the problem at the PKB end of the interface.

Generally speaking PKB HL7 API requires coded data items to be presented as their textual equivalents. However, where a clearly defined code set is used – particularly where it is an NHS HSCIC supported code set – then PKB will consider supporting the value set within their system.

In developing interfaces to PKB, contributing organisations will be responsible for negotiating solutions and workarounds with PKB. Where appropriate sample messages, specifications and code value sets should be provided to PKB in support of interface development.

4.1 PURPOSE AND SCOPE OF INTERFACES

The purpose of the interfaces is to provide HL7 messaging from local Trust TIEs to CIE/Patients Know Best for the Phase 1 data sets. Where these are presently sent inbound to the Trust Integration Engine (TIE) there should not be any new inbound feeds required just additional outbound interfaces.

These data sets will provide patients and CIE participating organisations with a comprehensive view of their hospital activity, pathology/radiology reports and correspondence.

In practice for Phase 1 this means the following message flows will be required to PKB’s HL7 API.

Data sets	HL7 Message types to be supported
All Registrations, Demographic updates, Inpatient ADT and Undo / correction of these	ADT^A28, ADT^A31, ADT^A01, ADT^A02, ADT^A03, ADT^A08, ADT^A11, ADT^A12, ADT^A13
OP appointment booking, rescheduling, cancellation & DNA	SIU^S12, SIU^S14, SIU^S15, SIU^S26 It is conceivable some Acute Trusts may presently receive ADT^A04 or ADT^A05 messages for OP Appointment scheduling events. It is assumed PKB can transform the data in these to support OP Appointment scheduling information.
Pathology results	ORU^R01
Radiology results	ORU^R01
Waiting List activity	<i>Subject to further analysis</i>

<p>Unstructured documents</p>	<p>MDM^T02</p> <p>PKB have a preference for HTML payloads for the document but can accept PDF as well.</p> <p>The following general document categories are suggested for inclusion in Phase 1 where they are available/supportable –</p> <ul style="list-style-type: none"> • ED Discharge Summaries • IP Discharge Summaries • OP Clinic Letters and other clinical (as opposed to admin) correspondence to the GP • Diagnostic reports other than Path/Rad (eg Endoscopy, Echocardiography, Vascular ultrasound, Respiratory function etc) • Appointment letters <p><i>PKB are presently in discussion with the project to confirm correspondence and other document metadata which is required for each document type</i></p>
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Notable exceptions are as follows and the reasons for these are discussed in a later section -

- Merge messages – A34/A40 – not appropriate until local number merging strategy agreed

4.2 INTEGRATION ARCHITECTURE

4.2.1 LAYER 7 PROTOCOL

The HL7 API exposes a SOAP XML web services API over HTTP. Existing documentation for this is available at <http://dev.patientsknowbest.com>. However, this is presently being extended and enhanced by PKB for the CIE project.

The interface uses a minimal SOAP wrapper with a standard HL7 message as the payload in a CDATA [] block. The SOAP response returns a standard HL7 ACK message with the usual accept/reject codes.

Standard SOAP login username and password are required for this API. There is a Sandbox environment available for development and testing.

Although not specifically discussed in PKB's HL7 API documentation, each trust may choose to effect several connections to the HL7 API rather than send all message types down a single connection.

4.2.2 INFRASTRUCTURE ISSUES

The PKB HL7 API specifies HTTPS and their infrastructure is hosted within the N3 network. However, as part of development relevant stakeholders should discuss with PKB what other security elements will need to be considered. As a minimum appropriate firewall provision will be required.

4.2.3 MESSAGE FILTERING

The scope of interfaces will be determined by contributing organisations. The only filtering requirement which is presently confirmed is that interfaces are restricted to messages carrying an NHS Number, which in the case of A28 and A31 messages should be verified.

4.2.4 ACTIVITY AND SCHEDULING INFORMATION

Where specialty information is provided in messages to PKB e.g. scheduled cardiology appointment, the list of codes are also categorised into general, mental, sexual or social. These categorisations can be found on the CIE website Resources page (<https://www.careinformationexchange-nwl.nhs.uk/resources>).

4.2.5 PATHOLOGY AND RADIOLOGY RESULT MESSAGES

PKB will manage translation of local Pathology test codes to the LOINC codes used by PKB. All other codes remain the responsibility of contributing organisations unless otherwise agreed by the organisation with PKB.

Pathology and Radiology test codes are used to categorise data into the four record categories (general, mental, sexual, and social). A list of codes already categorised can be found on the CIE website Resources page (<https://www.careinformationexchange-nwl.nhs.uk/resources>) however if there are additional local test codes in use which are not covered by those already categorised then these will need to be specified to the CIE team.

Whilst all results are available to professionals immediately, the display of sensitive results to patients can be specified on a test by test basis. This is to enable time for clinicians to hold MDT meetings and contact the patient to discuss their case before they receive potentially disturbing results. These delays are specified by each site. However a recommended standard has been developed by the CIE team and can be found on the CIE website Resources page (<https://www.careinformationexchange-nwl.nhs.uk/resources>).

5 REST API

PKB provide a REST API which is available at <http://dev.patientsknowbest.com> and can be used for application level integration and which can be used by client systems to provide integrated access to the PKB record. This solution uses an OAuth2.0 authentication model and PKB have issued a paper outlining how this model can be used by client systems to implement a single sign on solution (see below).

6 ACCOUNT CREATION & SINGLE SIGN-ON

PKB have provided facilities within the REST API to support bulk account creation. However, it will be up to each participating organisation to design local solutions to utilise this.

PKB have provided facilities to support single sign-on utilising OAuth2.0. Organisations may wish to use this to provide user/patient context sensitive integration of PKB into their core clinical systems. Again, it will be up to each participating organisation to design local solutions to utilise this although the CIE project team will be available to offer advice on how this has been implemented to date.

Documentation of the PKB approach to account creation and single sign-on can be found here:

https://docs.google.com/document/d/1dsM-0_QQGIQn-ED0g4kMT4GIRWHZ4hGu5cE-ARUGBPs/edit#heading=h.n28gfsqgptya