DIGITAL REFERRAL PRESCRIPTION

Integration Guide

This document is a manual for integrating into the Digital Referral Prescription project. It provides guidelines and instructions to ensure seamless participation in the project.

Contact: integration-support@ehealth.fgov.be

Smals ICT for society

RIZIV - INAMI

eHealth

1. Contents

2. Document version

Version	Status	Date	Author	Description
0.1	Draft	01/06/24	Smals	Initial version
1.0	Published	18/10/24	Smals	First release

3. Glossary

Term	Meaning
“blinded” Pseudonymization	The eHealth Blinded Pseudonymization REST service prevents the association of personal and medical data whether they are in the database, in transit on the network, or used during processing. This service generates a unique pseudonym for each patient to keep their identity private and secure.
DRP	Digital Referral Prescription
FHIR	FHIR (Fast Healthcare Interoperability Resources) is a standard framework created by HL7 (Health Level Seven International) to facilitate the exchange of healthcare information electronically.
IAM	Identity & Access Management
SSIN	Social Security Identification Number
UHMEP	Unaddressed Health Message Exchange Platform - FHIR API

4. Preface

This is an ongoing project, meaning that only the following target groups are currently supported

Target groups
Physician
Nurse
Patient
Midwife (before 2018)[1]

[1]Midwives who graduated before October 1, 2018 can perform the same acts as nursing practitioners; midwives who graduated after September 30, 2018 can perform certain nursing acts (only in the fields of maternity, fertility, neonatology and gynecology). In addition to their INAMI midwife number, these two groups of caregivers receive an INAMI nursing practitioner number with a 4X2 or 4X6 qualification code,even if they do not have a nursing practitioner VISA.

5. Introduction

UHMEP ("Unaddressed Health Message Exchange Platform") is an exchange platform that stores referral prescriptions and medical proposals and makes them available to healthcare professionals and patients.

The goal of this project is to digitize referral prescriptions and medical proposals to facilitate their processing and exchange among various stakeholders: the patient, the caregiver, and the prescriber.

Referral prescriptions are non-drug prescriptions that a patient receives from their doctor (the prescriber) for a particular issue. A referral prescription is carried out by the caregiver. For example, it may be a prescription for wound care, an X-ray, etc.

A medical proposal results from the reverse process, where the caregiver creates a medical proposal for the prescriber for an issue they have identified in the patient. This could be a proposal to extend a treatment or to initiate a new treatment.

Digitizing referral prescriptions and medical proposals will reduce administrative burden by decreasing the use of paper versions and enabling the instant retrieval of specific prescriptions. Additionally, the prescription can be simultaneously accessed by different stakeholders, which was not possible with paper versions.

Another advantage of this digitization is the centralization of all this information in a single location, the UHMEP database. This centralization will enable INAMI to perform statistical analyses and implement certain controls (data analysis, trend anticipation, etc.).

UHMEP also provides a **web application** that interfaces with the **UHMEP FHIR API**. This application utilizes **three web components** that allow for the creation, viewing, and interaction with citizen prescriptions. These web components are made available to integrators who wish to interface with the UHMEP API quickly.

This integration guide is intended for all companies interested in integrating various UHMEP digital referral prescription solutions. We will present the different methods to achieve this and outline the procedures to follow to be recognized as certified integrators.

6. Integration flow

This chapter will explain how to integrate with the Digital Referral Prescription project.

The chapter is divided into sections, the global flow overview and the three main sections explained.

6.1. The global flow

The flow presented in this section outlines the step-by-step actions required to transition from an unintegrated state to full integration. Subsequent sections of this document will elaborate on each step in greater detail.

6.2. Prerequisite

This flow is designed to guide integrators through the optimal integration process.

To request to register as a candidate, it is requested that all integrators introduce themselves and their company by sending an email to integration-support@ehealth.fgov.be with the following info:

What	Description	Example
First and last name	The first name and last name of the company's contact person	John Doe
Organization	The software integrator company name	Aqme Care
Professional email address	The email address that should be used to contact the software integrator	john.doe@aqme.be
Short description of the access request	Description of the reason why the company is willing to integrate the project	We are a leading actor in the radiology industry providing services for all Belgian hospitals and are eager to use your web component within our web solution.
Which solution we are interested in	Choose which solution you are willing to use (1-n)	☐ UHMEP FHIR API ☐ ProWeb App ☐ Web Component
Users type of your solution	Which medical discipline uses your software for the creation, consultation of the prescription, and its execution?	General Practitioners, Nurses, Dentist,....
Volumetry	The target average amount of prescriptions treated by your services	200 prescriptions a day

6.3. Flows

Currently, the project Digital Referral Prescription offers 3 possible integrations, which will be described in this section.

Name	Pro Web App	Web Components	UHMEP FHIR API
Description	**Simple Flow** 🚀 ● No integration needed ● No update to do	**Intermediate flow** ● Small integration needed ● Updates to do	**Complex Flow** 🐌 ● Full integration needed ● Security Commitment ● Homologation needed ● Updates to do
Homologation	● Require Only administrative doc to fill	● Require + validation testing Administrative doc to fill and prove that the web components were well integrated	● Require + homologation testing The full homologation testing and proof need to be performed

💡 Note: Several bricks can be used simultaneously (Eg. pro web app + 1 web component or pro web app integrated within your software).

6.3.1. Pro Web App (Simple Flow 🚀)

The pro web app has the fastest flow when using digital referral prescriptions. Requiring a simple homologation, the Pro web app is a fully functional solution that includes the whole solution to create, list, and consult details of a digital referral prescription. The onboarding is straightforward, as prescribers, caregivers, and patients simply need to authenticate themselves via the provided link to access and start using the app according to their needs.

Role	Link
Caregiver	https://wwwacc.referral-prescription.ehealth.fgov.be/frontend/app

Prescriber	https://wwwacc.referral-prescription.ehealth.fgov.be/frontend/app

6.3.2. Web Component (Intermediate Flow)

These web components are small applications designed to be integrated directly into the integrator's ecosystem for implementing the digital referral prescription project. By utilizing these components, integrators can significantly reduce the work required for full integration. Additionally, they will not need to foresee any type of homologation to access the referral prescription materials.

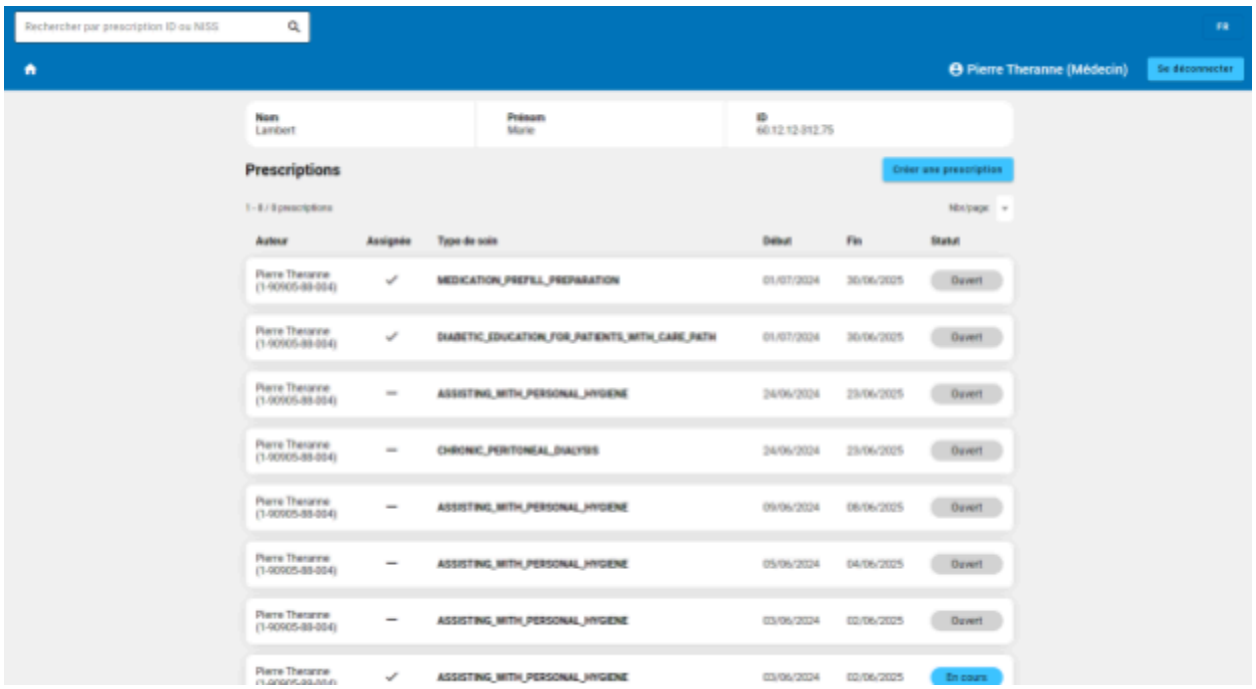
There are 3 web components currently accessible via GIT (link available in September).

A client ID is needed to integrate the web component (see IAM onboarding document) but no token exchange.

Tips: a showcase is available on Git see 9. Resources and links

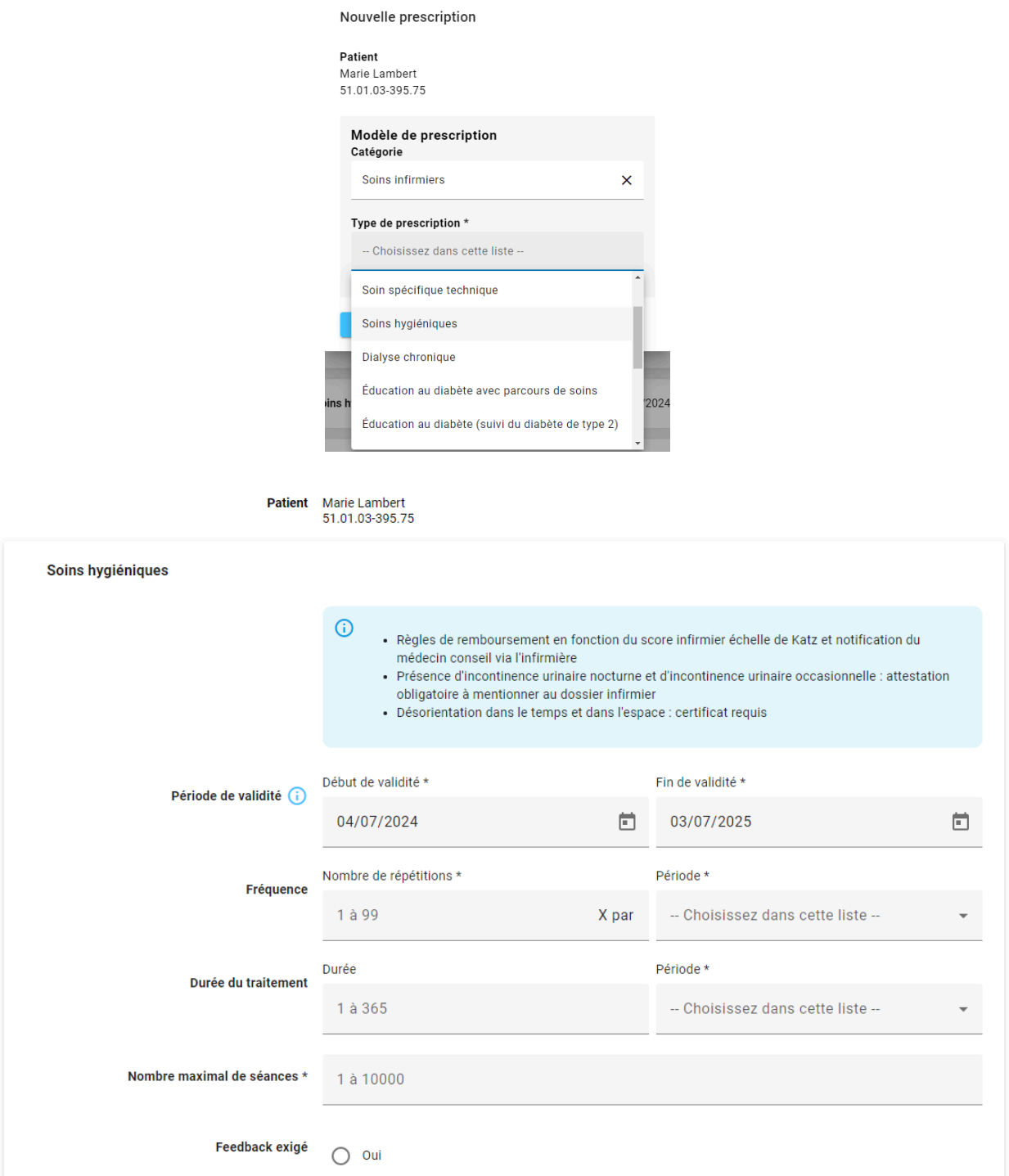
6.3.2.1. Listing

The web component ”list” allows listing the ongoing prescriptions for a given SSIN (Social Security Identification Number).



6.3.2.2. Create

The web component ”create” is a dialog providing access to various prescription templates. Once a template is selected, the prescriber can fill out the necessary fields of the prescription and create it. The prescription will then be added to the patient's listing.



6.3.2.3. Details

The web component "*details*" provides a view of the prescription information. Depending on the viewer's role, certain buttons will be available. For example, a caregiver can execute a prescription.

6.3.3. UHMEP FHIR API (Complex Flow 🐌)

For the integrator already having software and willing to integrate the referral prescription project from a backend point of view, all of the functionalities are available through an API.

The following constraints must be respected to be able to integrate with the API :

- **Be authenticated by eHealth** (I.AM Connect – HealthCare Client) - UHMEP FHIR API is accessible through the eHealth API Gateway. Your software must therefore be authorized via eHealth onboarding (cfr. 7.2.3) and thus allow your end users to access the service through Realm Healthcare for persons.
- **Pseudonymization of citizen identity** - For the citizen, UHMEP FHIR API only accepts calls based on a pseudonymized national registry number (SSIN). As an integrator playing the role of a "Trusted Platform,"you are responsible for carrying out the transformation of the SSIN into a pseudonym using the eHealth blinded pseudonymization service. To help you in this process, Smals strongly recommends the use of its Java and javascript library. These libraries provide the methods necessary to carry out, error-free and efficiently, the different use cases of the eHealth pseudonymization service (pseudonymize an identifier, identify a pseudonym "In Transit", decrypt a pseudonym "In Transit", convert to a pseudonym "At Rest").
- **IAM Token Exchange -** Using the IAM Token Exchange service to exchange the initial user token is a security prerequisite in order to be able to contact the UHMEP FHIR API. A signature of security commitment is also required.
- **FHIR standard -** UHMEP API will use models for each type of referral prescription as well as for care proposals. These models will be based on the international FHIR standard and adapted at

the national level by the eHealth standardization team. FHIR is a standard that describes the format and the exchange of medical data between different computer systems.

- **Approval** - To receive access configurations for production, your software will have to go through an approval procedure;
    a. the strongly recommended use of the Pseudonymization library or the pseudonymization process custom integration flow.
    b. Performing use cases made available on the FHIR Test Server.
    c. Completion of business use cases during a live session to validate the Smals/eHealth best practices integration and RIZIV-INAMI business cases.

In order to integrate with the FHIR "UHMEP" API, in addition to eHealth service documentation, you will need:

Artefact	Description
UHMEP FHIR API - Cookbook	• FHIR reference • description of operation • endpoint to call • roles for users • business rules • request to send • response
UHMEP FHIR API - Error code list	List of error codes returned by the UHMEP web service to make it easier for your users to understand the errors.
Pseudonymization Library (Java or JavaScript library)	STRONGLY RECOMMENDED The "pseudonymization Helper" provides the methods necessary to carry out, error-free and efficiently, the different use cases of the eHealth pseudonymization service (pseudonymize an identifier, identify a pseudonym in transit, decrypt a pseudonym in transit, convert to a pseudonym "AtRest") to call the UHMEP API.
RIZIV INAMI Business documentation	GRP-NIHDI-5, Ref Prescription - EXTERNAL communication 1 | General | Microsoft Teams

Artefact	Description
UHMEP FHIR API - Cookbook	• FHIR reference • description of operation • endpoint to call • roles for users • business rules • request to send • response
Test scenario document	to be defined

6.3.4. Pseudo Library

The digital referral prescription project uses the latest privacy component to ensure that no personal data will be seen or transferred without being pseudonymized. To ensure that the needed level of security is shared across all integrators, a pseudonymization library will be available on Git in September 2024 (see *9. Resources and links*).

The Pseudonymization libraries are available on the Git of the project.

Library	Link
Java library	https://github.com/smals-belgium/pseudo-helper-java
JavaScript library	https://github.com/smals-belgium/pseudo-helper-js

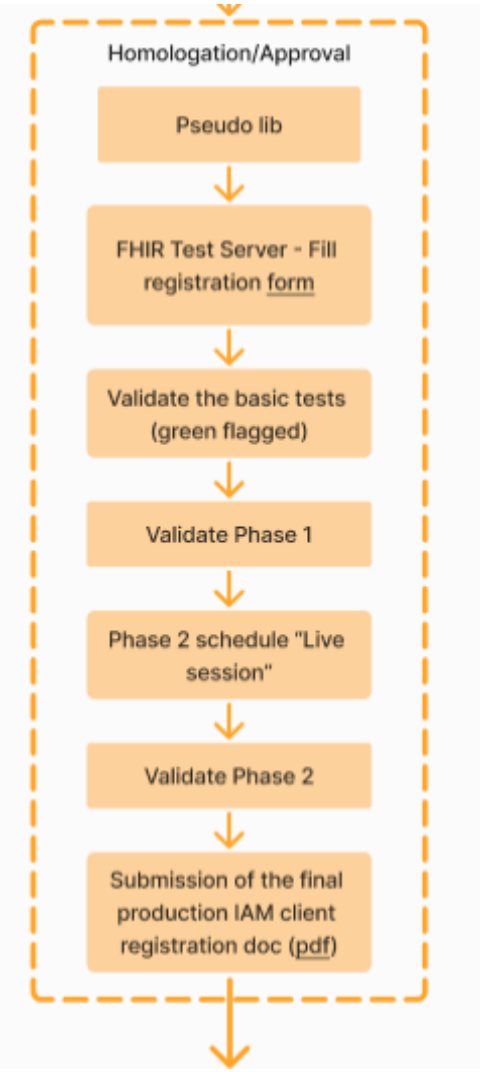
More information about the eHealth pseudonymization service can be found

https://www.smalsresearch.be/basisprincipes-voor-een-moderne-pseudonimiseringsdienst-2/

https://ehealth.fgov.be/ehealthplatform/fr/service-pseudonymisation-anonymisation

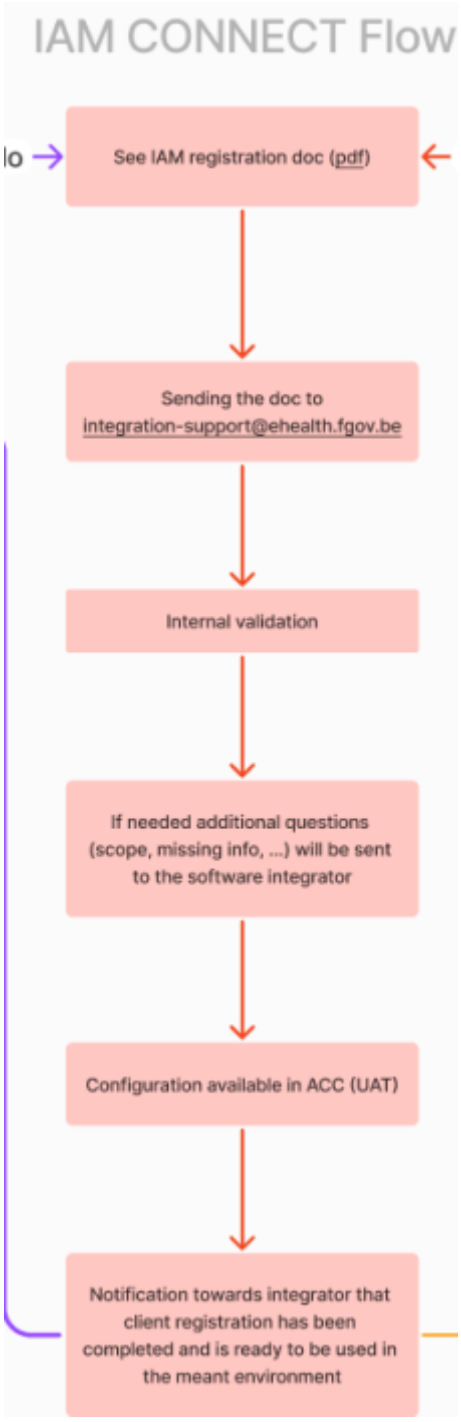
7. Testing the integration of UHMEP FHIR API

7.1.1. Flow



7.2. IAM Connect

7.2.1. Flow



7.2.2. IAM Connect Onboarding document

The document can be downloaded via 9. Resources and links

The Identity Access Management (IAM) Connect service is an authentication service provided by the eHealth platform. Its goal is to gather the necessary information to authenticate and authorize traffic coming from a server, granting it in a secure way the required access to utilize certain services, such as the Digital Referral Prescription project.

The project requires the use of the **I.AM Connect – HealthCare Client**. Each healthcare professional or entity must register upfront and gain access to the platform for managing and accessing patient prescriptions, requiring human authentication and identity verification.

The document is currently being rewritten and simplified.

Here below, find a list of needed information that would needs to be provided (*current version 1.2*) as well as some examples.

Information (fields with an * are mandatory)	**Explanation and allowed values**	**Example**
General information		
Client ID *	Enter the name of your application that will be used to perform the request	software-name
Name *	Enter the full name of your application	Software name
Specific Information		
Valid redirect URIs (separated by ;)	A valid redirect URI is needed in the configuration to redirect the user after a successful authentication. This URI is also used for redirecting the user after a logout.	https://app-acc.software-name.be/iam-connect-endpoint/; http://localhost/iam-connect-endpoint/

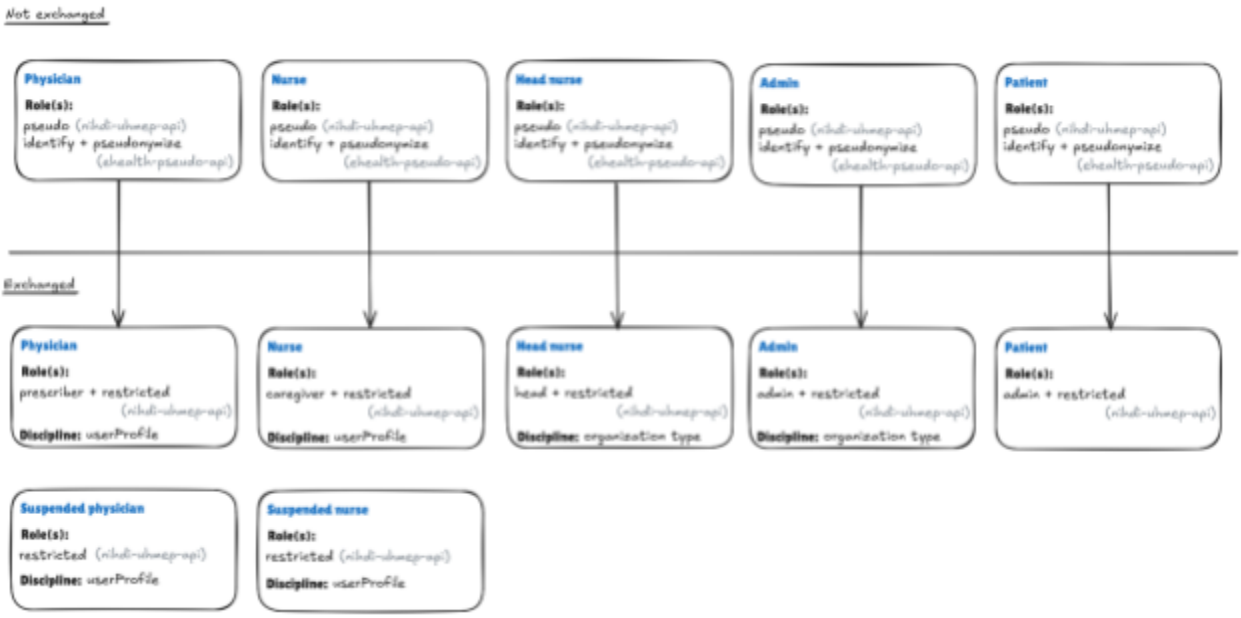
Scope	The list of access needed to use the Webcomponent or UHMEP Fhir API	• **web-origins** • **ssin** • **profile** • **roles** • **pseudo:api:pseudonymize** • **pseudo:api:identify** • **nihdi:uhmep:pseudo** • **nihdi:uhmep:pseudopseudo:profile**

7.3. IAM Token exchange Flow

The use of the IAM Token exchange Flow is a security prerequisite for the use of the UHMEP FHIR API solution.

Indeed, the IAM token will give users access to the solution but also has the rights of these users to the pseudonymization service. For security reasons, technical providers (such as Smals) cannot access these pseudonymization rights.

To avoid that happening, the **IAM Token exchange** has been put in place. Software Integrators will exchange the token obtained at the user connection for another token to call the UHMEP FHIR API. In this token exchanged, the right for the pseudonymization has been removed. The particularity of the patient token is that it will not contain the SSIN of the user connected. The patient's identifier will be pseudonymized and given in the user info token.



Here is a comparison between the two tokens generated for a physician.

Not Exchanged token	Exchanged token

{
"exp": 1716303333,
"iat": 1716303033,
"auth_time": 1716303006,
"jti":
"63894a67-335f-4dd9-9d83-29698e5b589f",
"iss":
"https://api-acpt.ehealth.fgov.be/auth/realms/healthcare",
"aud": [
"nihdi-uhmep-hcp",
"nihdi-uhmep-api",
"ehealth-pseudo-api"
],
"sub":
"5f586b43-a9a3-4324-98fa-2891d030b5e3",
"typ": "Bearer",
"azp": "nihdi-uhmep-hcp",
"nonce": "test1234",
"session_state":
"8e3dbd2e-a4d4-43b0-a6ec-d76abdc8e39a",
"allowed-origins": [
 	
"https://extranet-acpt.referral-prescription.in.ehealth.fgov.be",
 	
"https://extranet-acpt.referral-prescription.ehealth.fgov.be",
 	
"https://wwwacc.referral-prescription.up.ehealth.fgov.be",
 	
"https://wwwacc.referral-prescription.ehealth.fgov.be",
 	
"https://wwwacc.referral-prescription.in.ehealth.fgov.be",
 	
"https://extranet-acpt.referral-prescription.up.ehealth.fgov.be"
],
"resource_access": {
"nihdi-uhmep-api": {
"roles": [
	{
	"exp": 1716303387,
	"iat": 1716303087,
	"auth_time": 1716303006,
	"jti":
	"44c812a1-ad9a-4c38-88e9-b61947286d2e",
	"iss":
	"https://api-acpt.ehealth.fgov.be/auth/realms/healthcare",
	"aud": [
	"nihdi-uhmep-fhir-hcp",
	"nihdi-uhmep-api"
	],
	"sub":
	"5f586b43-a9a3-4324-98fa-2891d030b5e3",
	"typ": "Bearer",
	"azp": "nihdi-uhmep-fhir-hcp",
	"session_state":
	"8e3dbd2e-a4d4-43b0-a6ec-d76abdc8e39a",
	"allowed-origins": [
	"https://unavailable"
	],
	"resource_access": {
	"nihdi-uhmep-api": {
	"roles": [
	"prescriber",
	"restricted"
	]
	}
	},
	"scope": "profile nihdi:uhmep:hcp",
	"sid":
	"8e3dbd2e-a4d4-43b0-a6ec-d76abdc8e39a",
	"act": {
	"azp": "nihdi-uhmep-hcp"
	},
	"name": "Julien Beard",
	"preferred_username": "97071143362",
	"locale": "nl",
	"given_name": "Julien",
	"family_name": "Beard",
	"userProfile": {
	"firstName": "Julien",
	"lastName": "Beard",

```
        "pseudo"
      ]
    },
    "ehealth-pseudo-api": {
      "roles": [
        "identify",
        "pseudonymize"
      ]
    }
  },
  "scope": "openid pseudo:api:identify
profile ssin pseudo:api:pseudonymize
nihdi:uhmep:pseudo",
  "sid":
"8e3dbd2e-a4d4-43b0-a6ec-d76abdc8e39a",
  "ssin": "97071143362",
  "name": "Julien Beard",
  "preferred_username": "97071143362",
  "locale": "nl",
  "given_name": "Julien",
  "family_name": "Beard",
  "userProfile": {
    "firstName": "Julien",
    "lastName": "Beard",
    "ssin": "97071143362",
    "physician": {
      "recognised": true,
      "nihii11": "18471075004"
    }
  }
}
```

```
    "ssin": "97071143362",
    "physician": {
      "recognised": true,
      "nihii11": "18471075004"
    }
  },
  "client_id": "nihdi-uhmep-hcp"
}
```


Step by step

Technical information can be consulted on the eHealth site in the [“Pseudo REST – Security Commitment for IAM Token eXchange” document.]

Steps	Description
1	Integrator must first retrieve an access token from IAM Connect.
2	Integrators can then send a request to retrieve the exhanged token. Token Exchange Request

Content-type : application/x-www-form-urlencoded

POST *https://api-acpt.ehealth.fgov.be/iam/v2/protocol/oauth/tokenExchange*
*?**requested_token_type=**urn:ietf:params:oauth:token-type:access_token*
*&**grant_type=**urn:ietf:params:oauth:grant-type:tocken-exchange*
*&**subject_token=**{acces_token}*
*&**subject_token_type=**urn:ietf:params:oauth:token-type:access_token*
*&**client_id**={client_id}*
*&**audience**=nihdi-uhmep-fhir-hcp*

Success

If everything went well, you should receive a response with a HTTP status code equals to 200 and the following body :

```
{
   "access_token": "{new_access_token}",
   "token_type": "bearer",
   "refresh_token": null,
   "issued_token_type":
"urn:ietf:params:oauth:token-type:access_token"
}
```

7.3.1. Security Commitment for IAM Token Exchange

The document can be downloaded via 9.Resources and links

An integrator playing the role of a “Trusted Platform” must also sign and abide by the Annex A – Security commitment from the Trusted Platform document.

The signature of this document is required in the integration with the UHMEP FHIR API solution.

7.3.2. Flow

8. Contacts

Question	Contact
General questions about integration or project	integration-support@ehealth.fgov.be
Specific issue to log in to eHealth	integration-support@ehealth.fgov.be
Business project leader	pndv@riziv-inami.fgov.be

9. Resources and links

Resource	Version
Pseudo REST – Security Commitment for IAM Token eXchange	1.0
I.AM Connect Healthcare Client Registration	1.2
Fhir test server registration form	1.0
SSO from fat to thin client	1.2
Github smals-belgium	N/A
Onboarding flow	1.2
eHealth Pseudonymization doc	1.0
SSO doc	1.1

10. FAQ

ID	Question	Answer
1.	**How do I reach for help?**	See *8. Contacts*
2.	**Where do I download examples of code?**	See *9. Resources and links*
3.	**How do I get my access to the project?**	See *8. Contacts*
4.	**What is the pseudonymization?**	See . Pseudo Lib
5.	**IAM configuration, is it possible to use wildcards?**	Yes
6.	**IAM configuration, is it possible to give several URLs?**	Yes, see *7.2.2. Onboarding document*

7.	**What is the communication standard used within the project?**	Fhir
8.	**As an integrator can I only use one component?**	Yes they are independent and can be used independently
9.	**As an integrator can I onboard without IAM connect?**	No is it mandatory to onboard with IAM Connect
10.	**As an integrator, can I onboard without IAM Token exchange?**	It is mandatory to onboard with the IAM token exchange for the use of UHMEP FHIR API solution. For the Pro Webapp and Web components solution this is not required.
11.	**What is the list of all authorized target groups?**	See section target groups
12.	**What if my target group is not present in the list**	Get in contact with the Business project leader. See *8. Contacts*
13.	**SSO, what is possible, and what is not?** **Is it available?**	Yes it is possible, see the doc on the eHealth platform link **Use Case 1** The general practitioner uses locally installed software and an e-Health certificate to access our basic services (SOAP). For this, the solution described below exists.

		The user will not need to authenticate again in the external web application (e.g., TRIO), but will have to confirm their profile. 1. The software calls eHealth SingleSignOnService (https://services.ehealth.fgov.be/IAM/SingleSignOnService/v1) using the general practitioner's certificate (.p12). 2. SingleSignOnService creates an IDP session and returns a unique URL that can be used only once. This URL will start with https://www.ehealth.fgov.be/idp/profile/SAML2/Bearer/Artifact and will contain a redirect URL, which will point to the UHMEP web application (– url to be confirmed). 3. The software opens a browser window with the unique URL returned by SingleSignOnService as target URL. 4. The browser opens the unique URL returned by SingleSignOnService. 5. The browser receives the content of the unique URL and creates the IDP cookies that will identify the general practitioner on the IDP. 6. The browser follows the redirect url to be confirmed). 7. The browser receives the Angular application. Since the general practitioner has an active session on the IDP, when the Angular application will redirect the general practitioner to the IDP, he will not have to authenticate himself because he is already known by the IDP. The only action that remains for the general practitioner is to select its profile on the IDP page.

		Cookbook: https://www.ehealth.fgov.be/ehealthplatform/file/cc73d96153bbd5448a56f19d925d05b1379c7f21/836618aaace3cd0450e7ee68d19c423df8e5b30e/i.am---sso-from-fat-to-thin-client---tech-specs-v1.2-dd-20042022.pdf **Use Case 2** The general practitioner uses cloud-based software and an e-Health certificate to access our basic services (SOAP). For this, the solution described below exists. The user will not need to authenticate again in the external web application (e.g., Digital referral prescription), but will have to confirm their profile.

1. The software calls eHealth SingleSignOnService (https://services.ehealth.fgov.be/IAM/SingleSignOnService/v1) using the general practitioner's certificate (.p12).
2. SingleSignOnService creates an IDP session and returns a unique URL that can be used only once. This URL will start with https://www.ehealth.fgov.be/idp/profile/SAML2/Bearer/Artifact and will contain a redirect URL, which will point to the Trio web application (– url to be confirmed).
3. The software opens a browser window with the unique URL returned by SingleSignOnService as target URL.
4. The browser opens the unique URL returned by SingleSignOnService.
5. The browser receives the content of the unique URL and creates the IDP cookies that will identify the general practitioner on the IDP.
6. The browser follows the redirect url to be confirmed).
7. The browser receives the Angular application. Since the general practitioner has an active session on the IDP, when the Angular application will redirect the general practitioner to the IDP, he will not have to authenticate himself because the IDP already knows him. The only action that remains for the general practitioner is to select its profile on the IDP page.

Cookbook
https://www.ehealth.fgov.be/ehealthplatform/file/cc73d96153bbd5448a56f19d925d05b1379c7f21/836618aaace3cd0450e7ee68d19c423df8e5b30e/i.am---sso-from-fat-to-thin-client---tech-specs-v1.2-dd-20042022.pdf

		Use Case 3 The general practitioner uses cloud-based software and IamConnect for authentication (REST). - Regarding an application that runs in a browser (Webapp), in that case, the user has already logged in via IAM Connect and has a valid token/session . With the same token, they can also log in to the external Webapp, for example, UHMEP. - A solution is provided for this in the case of a Web client, but it is not yet in production.
14.	**IAM connect, can I reuse an already existing Client ID**	Yes

Digital Referral Prescription onboarding workflow (v0.5)