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**Implementing the Allergy Archetype in FHIR**

**Improving allergy interoperability**

Document management

Revision History

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| 0.1 | 26/09/2018 | Initial draft |
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Glossary of Terms

| Term / Abbreviation | What it stands for |
| --- | --- |
| AMP | Actual Medicinal Product |
| Archetype | A formal re-usable model of a domain concept. |
| dm+d | Dictionary of medications and devices is a UK terminology system published by TRUD. |
| FHIR | Fast Healthcare Interoperable Resources is a healthcare interoperability standard supported by HL7. |
| GP2GP | Electronic transfer of a patient’s electronic health record between two general practices. |
| GPSoC | General Practice Systems of Choice framework |
| SNOMED-CT | **S**ystematized **No**menclature Of **Med**icine **C**linical **T**erms is a systematically organised computer processable collection of [medical terms](http://en.wikipedia.org/wiki/Medical_terms) providing codes, terms, synonyms and definitions used in clinical documentation and reporting. |
| TRUD | Technology Reference data Update Distribution is a service provided by the UK terminology centre at NHS Digital to provide updates to terminology. |
| VMP | Virtual Medicinal Product |
| VTM | Virtual Therapeutic Moiety |

References

| Document No. | Document title | Author |
| --- | --- | --- |
| AA1 | GPSoC Allergy Archetype Implementation Guidance | Pete Salisbury |
| AA2 | Implementing the Allergy Archetype in the GP2GP Message | Pete Salisbury |
| AA4 | GPSoC Allergy Archetype - GP Connect Allergy Guidance | Pete Salisbury |

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Contents

[1. Introduction 5](#_Toc525900310)

[1.1. Purpose of document 5](#_Toc525900311)

[1.2. Populating and consuming allergy archetype data using FHIR 5](#_Toc525900312)

[2. Care Connect and GP Connect APIs 6](#_Toc525900313)

[3. Populating FHIR resource with drug allergy archetype data 6](#_Toc525900314)

[3.1. Populating the code field 7](#_Toc525900315)

[3.2. Populating the criticality field 7](#_Toc525900316)

[3.3. Populating the field reaction.severity 7](#_Toc525900317)

[3.4. Populating the field reaction.manifestation 7](#_Toc525900318)

[3.5. assertedDate 8](#_Toc525900319)

[3.6. note 8](#_Toc525900320)

[4. Populating FHIR resource with items not in allergy archetype data 8](#_Toc525900321)

[4.1. Other elements to populate 8](#_Toc525900322)

[4.2. AllergyIntolerance elements not in use 13](#_Toc525900323)

# Introduction

## Purpose of document

This document details how to represent allergies that are in the format of the GPSoC Allergy Archetype in the FHIR® AllergyIntolerance resource.

It also details the relationships between the base FHIR, Care Connect and GP Connect versions of the resource and the new requirements for GP systems suppliers needed to support them.

### Background context

The allergy archetype model was developed to make allergies in GP clinical system interoperable. It was developed in conjunction with the GP2GP project, but it was always a consideration that it may improve allergy interoperability in the wider context.

FHIR is a standards framework for transferring healthcare data that was created by HL7 and is seen as a national leader in that field. GP Connect and Care Connect are FHIR-based APIs, used for transferring healthcare data for direct care in the UK that are required to deal with allergy data. To do this, they created versions or ‘profiles’ of the FHIR AllergyIntolerance resource to transport allergy data. While developing these profiles the GPSoC allergy archetype was taken into consideration so that it would be possible to populate the profiles with data in the allergy archetype format.

Links to the FHIR specification and to the AllergyIntolerance resource:

* [FHIR specification](https://www.hl7.org/fhir/index.html)
* [FHIR AllergyIntolerance resource](https://www.hl7.org/fhir/allergyintolerance.html)

## Populating the allergy archetype data using FHIR

This document explains how the allergy archetype data model relates to the FHIR profiles that have been developed. In doing this, it details how GP systems populate and consume these resources.

Within the FHIR AllergyIntolerance profile, it is possible to send both drug and non-drug allergies. However, the GPSoC allergy archetype is designed specifically to deal with drug allergies and so this document’s focus is solely concerned with the population of the resource for drug allergies.

It covers the following areas:

* Relationship between the Care Connect and GP Connect
* Populating the FHIR resource with allergy archetype data
* Populating the rest of the FHIR resource

There is also a further document containing the GP Connect allergy guidance which is relevant to implementers who are intending to populate or consume the allergyIntolerance resource.

# Care Connect and GP Connect APIs

The Care Connect APIs have been developed collaboratively by NHS Digital and the INTEROPen community to better support the delivery of care by using nationally defined Care Connect FHIR® resources. The Care Connect specification and FHIR profiles can be found at here:

* [Care Connect API](https://nhsconnect.github.io/CareConnectAPI/)
* [Care Connect FHIR profiles](https://fhir.hl7.org.uk/)

The Care Connect profiles are intended to be parent profiles to all other FHIR profiles that are created to support any UK health and social care FHIR implementations.

The GP Connect API is one of those implementations and its FHIR profiles are children of the corresponding Care Connect profiles. The GP Connect API has been created to support better clinical care by opening up information and data held within GP practice IT systems for use across health and social care.

The profiles created for GP Connect are constrained versions of the Care Connect profiles. This means that there are no additional fields/elements/values/extensions in the GP Connect profiles than are present within the Care Connect profiles.

An example of one of the constraints made to the Care Connect profile when creating the GP Connect profile is that the ‘recorder’ element in the Care Connect profile is optional and so has a cardinality of 0..1. However, in GP Connect, as we know that the name of whoever recorded the allergy on a GP system will have been stored, it has been made a *Mandatory* element with a cardinality of 1..1.

The GP Connect specification and profiles can be found at the following here:

* [GP Connect API (for structured record access)](https://nhsconnect.github.io/gpconnect/accessrecord_structured.html)
* [GP Connect profiles](https://fhir.nhs.uk/StructureDefinition)

All the Care Connect and GP Connect resources have been through a thorough clinical curation process, which was run by NHS Digital in conjunction with INTEROPen and involved specialists from all relevant fields and suppliers from clinical systems providers from primary and secondary care.

# Populating FHIR resource with drug allergy archetype data

The GP Connect AllergyIntolerance profile has been created in close collaboration with the four GP clinical systems suppliers in the UK. It has been designed to cater for the data that we know currently exists within GP clinical systems and is the most appropriate to use when exporting data from GP systems.

## Populating the code field

|  |  |  |
| --- | --- | --- |
| **Data type:** CodeableConcept | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The causative agent of the allergy **MUST** be represented using the code element in the AllergyIntolerance resource. If the causative agent was input into the system using the causative agent list defined in dm+d, then this **MUST** be populated in the code element.

.

## Populating the criticality field

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Required | **Cardinality:** 0..1 |

If the clinical system contains a qualifier for severity that is either ‘Life Threatening’ or ‘Fatal’ then the criticality **MUST** be set to high.

Distinguishes between life-threatening (high) and non-life-threatening (low) potential as well as unable-to-assess. It **MAY** be used in addition to severity within the reaction element to express severity – for example, systems that support a severity of life-threatening or Fatal **MAY** set criticality to high.

It **MAY** be used in conjunction with reaction/severity by systems which support a severity of life-threatening or equivalent.

## Populating the field reaction.severity

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Required | **Cardinality:** 0..1 |

Severities of Mild, Moderate, Severe are mapped directly to the allergy archetype model for ‘severity’ ValueSet. However, for values of ‘Life threatening’ and ‘Fatal’ this should be set to Severe and the ‘criticality’ should be populated with high.

## Populating the field reaction.manifestation

|  |  |  |
| --- | --- | --- |
| **Data type:** CodeableConcept | **Optionality:** Optional | **Cardinality:** 1..\* |

This maps to the reaction in the allergy archetype and represents the reaction resulting from the allergy/intolerance as a code.

This element is mandatory in the FHIR base profile and so if no data is present please use the nullFlavour as outlined here.

Where no code is available, but a textual description of the reaction is available, then the nullFlavor UNC **MAY** be used and the textual description conveyed via reaction/description.

If no reaction has explicitly been recorded, but the reaction element is present to convey severity, then reaction/manifestation **SHOULD** be coded as the nullFlavor NI.

If the patient has been asked, but is unable to specify a reaction the nullFlavor, ‘ASKU’ **SHOULD** be used.

## assertedDate

|  |  |  |
| --- | --- | --- |
| **Data type:** dateTime | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The datetime the record was recorded or believed to be true. Relates to ‘Date recorded’ from the allergy archetype model.

## note

|  |  |  |
| --- | --- | --- |
| **Data type:** Annotation | **Optionality:** Required | **Cardinality:** 0..\* |

The certainty element from the allergy archetype is not directly mapped to an element in the FHIR resource. Therefore, if the certainty exists in the clinical system it **MUST** be populated in the note field. It **MUST** be the first item in the notes field and represented as a key value pair – for example, Certainty : Likely.

All text associated with the AllergyIntolerance including user-entered notes and qualifiers is grouped together and expressed in this field, which ensures unmapped coded values or qualifiers are not lost.

Must be used to contain any textual data relevant to the allergy.

# Populating FHIR resource with items not in allergy archetype data

## Other elements to populate

### id

|  |  |  |
| --- | --- | --- |
| **Data type:** Id | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The logical identifier of the Medication resource.

### meta.profile

|  |  |  |
| --- | --- | --- |
| **Data type:** uri | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The AllergyIntolerance profile URL.

Fixed value: <https://fhir.nhs.uk/STU3/StructureDefinition/CareConnect-GPC-AllergyIntolerance-1>

### extension[encounter]

|  |  |  |
| --- | --- | --- |
| **Data type:** Reference | **Optionality:** Required | **Cardinality:** 0..1 |

Contains a link to the encounter resource.

### extension[allergyEnd]

|  |  |  |
| --- | --- | --- |
| **Data type:** extension | **Optionality:** Required | **Cardinality:** 0..1 |

Contains the date and reason the allergy or intolerance was recorded as resolved.

Must be populated if the clinicalStatus is set to resolved.

### extension[allergyEnd].endDate

|  |  |  |
| --- | --- | --- |
| **Data type:** dateTime | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The date the allergy or intolerance was recorded as resolved.

Must be populated if the clinicalStatus is set to resolved.

### extension[allergyEnd].endReason

|  |  |  |
| --- | --- | --- |
| **Data type:** String | **Optionality:** Mandatory | **Cardinality:** 1..1 |

The reason why the allergy or intolerance has been resolved. In exceptional cases where for legacy data there is no endReason recorder in the system then this **MUST** be populated with the text ‘No information available’.

### extension[evidence]

|  |  |  |
| --- | --- | --- |
| **Data type:** Reference(DiagnosticReport) | **Optionality:** Optional | **Cardinality:** 0..1 |

Reference to confirmatory diagnostic report – for example, pathology RAST test result.

### identifier

|  |  |  |
| --- | --- | --- |
| **Data type:** Identifier | **Optionality:** Mandatory | **Cardinality:** 1..\* |

This is for business identifiers.

This is sliced to include a cross-care setting identifier which **MUST** be populated. The codeSystem for this identifier is <https://fhir.nhs.uk/Id/cross-care-setting-identifier>.

This **MUST** be a GUID.

*Providing* systems **MUST** ensure this GUID is globally unique and a persistent identifier (that is, doesn’t change between requests and therefore stored with the source data).

Where *consuming* systems are integrating data from this resource to their local system, they **MUST** also persist this GUID at the same time.

### clinicalStatus

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Mandatory | **Cardinality:** 1..1 |

active for all active allergies. resolved for resolved allergies.

GP systems which support the concept of resolved/ended allergies **MUST** set the clinicalStatus of resolved allergies to resolved and populate the end date field, where an allergy or intolerance is resolved/ended.

### verificationStatus

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Mandatory | **Cardinality:** 1..1 |

Fixed value of unconfirmed.

**Important:** This value is mandatory in the base FHIR resource so cannot be removed. It is not a concept in GP systems and as such meaning **MUST NOT** be attributed to this field in consuming systems.

### type

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Optional | **Cardinality:** 0..1 |

Set to allergy for reactions which are allergenic in nature (immunological), a value of intolerance **MAY** be used to indicate adverse reactions (not immunologic in nature). Where the type is unknown the type element may be omitted.

Some systems allow explicit identification of adverse reactions and intolerances and the type **MUST** be used to make this distinction where it exists.

### category

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Mandatory | **Cardinality:** 1..\* |

Use medication for all drug allergy types, environmental for all non-drug allergies. The other values in the ValueSet (food and biologic) **MUST** **NOT** be used.

It is expected that it will always be possible to assign a category of ‘medication’ for drug allergies or ‘environmental’ for all other types of allergy/intolerance. Generally, the choice in a given system is explicit. The GP suppliers **MUST** follow the categorisation already in use in populating the GP2GP message.

In some cases, the type of allergy/intolerance may be more general – for example, a system designated type of Other or equivalent. In such cases, if the allergy/intolerance entry interacts with prescribing decision support it **MUST** be assigned a category of medication. Otherwise, the category of environmental **MUST** be used.

### patient

|  |  |  |
| --- | --- | --- |
| **Data type:** Reference(Patient) | **Optionality:** Mandatory | **Cardinality:** 1..1 |

A reference to the Patient who has, or had, the allergy or intolerance specified.

### onset.DateTime

|  |  |  |
| --- | --- | --- |
| **Data type:** dateTime | **Optionality:** Required | **Cardinality:** 0..1 |

Date when allergy/intolerance first manifested. Currently restricted to values of dateTime for GP Connect.

This field **MUST** be populated where the GP system records an explicit onset date for an allergy.

The asserted date is when the allergy related to the patient was asserted. In many cases, this will be when the allergy is entered onto the system, although some systems may allow this date to be modified.

### recorder

|  |  |  |
| --- | --- | --- |
| **Data type:** Reference | **Optionality:** Mandatory | **Cardinality:** 1..1 |

Who recorded the allergy in the clinical system.

### asserter

|  |  |  |
| --- | --- | --- |
| **Data type:** Reference | **Optionality:** Required | **Cardinality:** 0..1 |

Source of the information about the allergy.

### lastOccurrence

|  |  |  |
| --- | --- | --- |
| **Data type:** dateTime | **Optionality:** Optional | **Cardinality:** 0..1 |

Represents the date and/or time of the last known occurrence of a reaction event.

This data item may not currently be available from providing systems and in this circumstance **MAY** be omitted. Omission **SHOULD NOT** prejudice the ability of providers and consumers to process this element if and when it is available.

### reaction.manifestation

|  |  |  |
| --- | --- | --- |
| **Data type:** CodeableConcept | **Optionality:** Optional | **Cardinality:** 1..\* |

Conveys the reaction resulting from the allergy/intolerance as a code.

This element is mandatory in the FHIR base profile and so if no data is present please use the nullFlavour as outlined here.

Where no code is available, but a textual description of the reaction is available, then the nullFlavor UNC **MAY** be used and the textual description conveyed via reaction/description.

If no reaction has explicitly been recorded, but the reaction element is present to convey severity, then reaction/manifestation **SHOULD** be coded as the nullFlavor NI.

If the patient has been asked, but is unable to specify a reaction the nullFlavor, ‘ASKU’ **SHOULD** be used.

### reaction.description

|  |  |  |
| --- | --- | --- |
| **Data type:** String | **Optionality:** Optional | **Cardinality:** 0..1 |

Conveys the textual description of the manifestation where no code is available.

A consuming system **MAY** concatenate the contents (appropriately labelled) with text in AllergyIntolerance.note if a textual description of the manifestation is not supported in the receiving system record structure.

### reaction.severity

|  |  |  |
| --- | --- | --- |
| **Data type:** Code | **Optionality:** Required | **Cardinality:** 0..1 |

Severities of Mild, Moderate, Severe are mapped directly to the ValueSet. Map life threatening to Severe and populate criticality with high.

### reaction.exposureRoute

|  |  |  |
| --- | --- | --- |
| **Data type:** CodeableConcept | **Optionality:** Optional | **Cardinality:** 0..1 |

The route by which exposure to the substance causing the reaction occurred. Utilise the dm+d route codes.

## AllergyIntolerance elements not in use

The following elements **SHALL NOT** be populated:

### reaction/note

|  |
| --- |
| **Data type:** Annotation |

AllergyIntolerance.note should contain all the consolidated text from the Allergy/Intolerance.

### reaction/onset[x]

|  |
| --- |
| **Data type:** dateTime |

Onset explicitly supplied via AllergyIntolerance.onset[dateTime].

### reaction/substance

|  |
| --- |
| **Data type:** CodeableConcept |

The causative is explicitly and specifically coded via AllergyIntolerance.