

DIGITAL HEALTH ECOSYSTEM WALES

Software Development Kit

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Background

Significant progress has been made in establishing NHS Wales National Architecture including the provision of a large number of application and other integration capabilities that have been deployed to support information sharing between applications and services. This has reduced duplication and improved efficiency and patient safety.

This document, the NHS Wales Software Development Kit, provides the first phase of a series of publications to support NHS Wales organisations and other partners in the public and private sector detailed information to enable standardised application development. This will help facilitate opening the NHS Wales technical architecture to a wider audience of developers and system suppliers. This first iteration includes systems integration in a limited area of scope. Future iterations of the SDK will expand on this information to cover areas including:

- Application look and feel (User interface standards)
- Specific platform requirements (e.g. minimum browser levels, databases etc)
- Governance, safety and testing requirements
- Common Information Requirements and definitions
- Standardisation of integration approaches
- Common implementation examples and use cases

Through the Digital Health Ecosystem, our vision is to create a library of Application Programming Interfaces (API) that implementers can adopt to simplify integration and interoperability with NHS Wales National Architecture.

The first Application Programming Interface that NHS Wales Informatics Service has provisioned is to identify the demographic details (and NHS Number) of patients presenting at NHS Wales.

This document aims to provide implementation guidance required to support implementation of this API.

As additional services evolve, these will be made available and this document will be updated.

Availability of Services

This development is hosted on a test platform. The service must not be used or connected to any live system or service. The data within the service is **test data** and must not be considered or used for live use.

The service may be unavailable for maintenance.

Implementation Description

The API is based on the HL7 FHIR specification. A full description of the FHIR specification is available at <https://www.hl7.org/>.

The API is located at <https://dhew.wales.nhs.uk/hapi-fhir-jpaserver-example/>.

While the API implements the full FHIR specification, it only contains the data for 100 fictitious patient records.

Use case 1: Retrieve patient records by performing a patient demographic search

The C# code sample below illustrates how to retrieve patient records by performing a search using the patient's demographic details. This example requires HL7.Fhir.Specification.STU3 NuGet package, which provides client tools and functionality for working with the FHIR specification. To install the NuGet package to your .NET project, enter the following text in the Package Manger Console

```
PM> Install-Package HL7.Fhir.Specification.STU3 -Version 0.94.0
```

Documentation for this package is available here: <http://ewoutkramer.github.io/fhir-net-api/>

The code sample below shows how to search for patients with surname **Davies** who live in **Pentre Bach** and iterate through the search results within a simple console application.

```
using System;
using System.Linq;
using HL7.Fhir.Model;
using HL7.Fhir.Rest;

namespace FhirTestClient1
{
    class Program
    {
        static void Main()
        {
            // (1) Create a client object using the base URI of the FHIR API
            var client = new FhirClient("https://dhew.wales.nhs.uk/hapi-fhir-jpaserver-example/baseDstu3/");

            // (2) Perform a search for patients using demographic information. Search results are contained
            // within a 'Bundle' object. The searchResult.Total field indicates the number of results returned
            Bundle serchResult = client.Search<Patient>(new[]
            {
                "family=Davies",
                "address=Pentre Bach"
            });

            // (3) Loop through the seach results and print each patient's name and birthdate to the console
            for (int i = 0; i < serchResult.Total; i++)
            {
                var myPatient = (Patient) serchResult.Entry[i].Resource;

                HumanName name = myPatient.Name.First();
                string familyName = name.Family;
                string givenName = name.Given.First();
                string title = name.Prefix.First();

                Console.WriteLine($"{familyName.ToUpper()}, {givenName} ({title})");
                Console.WriteLine($"Born: {myPatient.BirthDate}");
            }
        }
    }
}
```

Alternatively, to perform the same search via a URL and to view the search results within a web browser, enter the following URL: <https://dhew.wales.nhs.uk/hapi-fhir-jpaserver-example/baseDstu3/Patient?family=davies&address=pentre%20bach&format=html/xml>

Use case 2: Retrieve patient records by patient identifier

The sample below illustrates how to retrieve patient records by performing a search using the patient's NHS number.

```
using System;
using System.Linq;
using H17.Fhir.Model;
using H17.Fhir.Rest;

namespace FhirTestClient1
{
    class Program
    {
        static void Main()
        {
            // (1) Create a client object using the base URI of the FHIR API
            var client = new FhirClient("https://dhew.wales.nhs.uk/hapi-fhir-jpaserver-example/baseDstu3/");

            // (2) Perform a search using the patient's NHS number. The namespace 'https://fhir.nhs.uk/Id/nhs-number0'
            // indicates an NHS number identifier
            Bundle serchResult = client.Search<Patient>(new[]
            {
                {
                    "identifier=https://fhir.nhs.uk/Id/nhs-number|3795624126",
                }
            });

            // (3) Print each patient's name and birthdate to the console
            var myPatient = (Patient)serchResult.Entry[0].Resource;

            HumanName name = myPatient.Name.First();
            string familyName = name.Family;
            string givenName = name.Given.First();
            string title = name.Prefix.First();

            Console.WriteLine($"{familyName.ToUpper()}, {givenName} ({title})");
            Console.WriteLine($"Born: {myPatient.BirthDate}");
        }
    }
}
```

Alternatively, to perform the same search via a URL and to view the search results within a web browser, enter the following URL: <https://dhew.wales.nhs.uk/hapi-fhir-jpaserver-example/baseDstu3/Patient?identifier=https%3A%2F%2Ffhir.nhs.uk%2FId%2Fnhs-number%7C3795624126&format=html/xml>