

Instructions related to the search function

Personal Health Record (Kanta PHR)

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1 Introduction

These instructions contain guidelines related to the search functions of the Personal Health Record (Kanta PHR). Chapter two includes instructions for paging, chapter three includes instructions for organising by time, chapter four has information about the use of the total search parameter, and chapter five contains information about modifiers and prefixes of the search functions supported by Kanta PHR. Json examples are found in the appendix, which is in chapter six.

The search parameter “patient” is not supported system-wide in Kanta PHR. It is not possible to search all resources of a certain person in the service, but the search can be made by focusing it, for example, on all measurement results of a certain person. The OR operator is supported with all token-type search parameters.

The search parameters of Kanta PHR are documented in CapabilityStatement. [Read more about Capability statement through this link \(Simplifier.net\)](#). If you want to read a Finnish-language interpretation of the search parameters, [you can read it in Capability Statement and in REST-api \(hl7.fi\)](#).

2 Instructions for the paging of search results

The default and maximum page size is 2,000, an example of setting the page size is in appendix 6.1. If you want to set the page size, it must be done in the first search request. Paging links “next”, “self” and “previous” are returned with the search result. “Self” is the link for the page to be shown, “next” is the link to the next result page, and “previous” is the link of the previous result page. The next page can be retrieved by using the “relation next” link. The total number of pages is not returned. There are no paging links if there is no next page. It is possible to move between pages in both directions.

The entire “next” link that gives the next page of the search result must be saved of the search result. The more detailed content of the link must not be processed. The `_getpages` shown in the link is an internal parameter of the implementation, referring to the paging set, and therefore it is not recommended to use it alone as a basis for the implementation. The description in the standard is as follows: “Typically, a server will provide its own parameters in the links that it uses to manage the state of the search as pages are retrieved. These parameters do not need to be understood or processed by the client.” [Read more about the subject on the FHIR standard page \(hl7.org\)](#). Json examples of paging and paging links are available in the appendices.

3 Organising by time

CapabilityStatement describes which resource types and fields support organisation.

The times for resources are supplemented to the nearest millisecond for comparison from the start to the end of the time in Kanta PHR in accordance with the following examples. If no time zone is given, Europe/Helsinki time is used.

- 2018 = 2018-01-01T00:00:00.000 - 2018-12-31T23:59:59.999
- 2018-01 = 2018-01-01T00:00:00.000 - 2018-01-31T23:59:59.999
- 2018-01 - 2018-03 = 2018-01-01T00:00:00.000 - 2018-03-31T23:59:59.999
- 2018-01-05 = 2018-01-05T00:00:00.000 – 2018-01-05T23:59:59.999
- 2018-01-01T13:28:17.239+02:00 = 2018-01-01T13:28:17.239+02:00 - 2018-01-01T13:28:17.239+02:00

The exact time must be given in the format 2018-01-01T13:28:17.239+02:00.

Organisation in Kanta PHR complies with the FHIR standard, i.e. the parameter without the prefix '-' (e.g. date) indicates an ascending order and a parameter with a prefix (e.g. -date) indicates a descending order. In order to organise the search result, the start of the time and then the end of the time are compared, and after that organisation is carried out in an ascending or descending order on that basis.

Resources without a time are interpreted chronologically as the oldest.

3.1 Ascending and descending order using times with a different precision

Times with a different precision, interpreted for the same start time, are organised in an order according to the end time opened in the search result. For example, the times 2018-01-01T00:00:00.000, 2018-01-01, 2018-01 and 2018 are interpreted as the same start time and they are organised according to the opened end time. If the precision of the end times also varies and they are interpreted as the same, the times are organised between themselves at random.

3.2 How are dateTime and period organised between themselves if the time to be compared is exactly the same?

In descending order, dateTimes and periods are organised in the following order: period start 2018-01-01-, complete period 2018-01-01 - 2018-01-05, dateTime 2018-01-01, period end - 2018-01-01 and no time. In ascending order, the times are organised in the opposite order: no time, period end, dateTime, complete period, and period start.

4 Use of “total” search parameter

The `_total` search parameter is supported in Kanta PHR. [See further information on the “total” search parameter on the standard page \(hl7.org\)](#). In the search result, `.total` element is returned only on the first page if the `_total` search parameter is not given at all. If “none” is given as the `_total` search parameter, the number is not returned on any page. If “estimate” is given as the `_total` search parameter, the total number at the time when the first page is returned shall be returned on all pages. If “accurate” is given as the `_total` search parameter, the actual number of all search results is calculated and returned again.

5 Supported modifiers and prefixes

The following modifiers are supported in Kanta PHR: “:exact”. The following prefixes are supported in Kanta PHR: `eq`, `gt`, `lt`, `ge`, `le`. If you wish, you can read more about the modifiers and prefixes of search results on the pages of the FHIR standard. [Read about prefixes in FHIR searches through this link](#). [Read about modifiers in FHIR searches through this link](#).

6 Unknown and unsupported parameters

Kanta PHR always ignores unknown or unsupported search parameters. The function is not affected by the handling value given in the prefer-header. [Read more about error handling in FHIR-standard. \(hl7.org\)](#)

7 Operation \$readWithIncludes

Within the personal health record, you have the capability to retrieve information using the `$readWithIncludes` operation. This operation is directed at an individual resource and retrieves both the requested resource and any resources that the retrieved resource references. For instance, if the blood pressure resource points to the heart rate resource, both resources are returned when using the operation.

Currently, this operation is supported for Observation, QuestionnaireResponse, CarePlan, and MedicationAdministration resource types. [The definitions of the operation can be found in the Simplifier project of the Personal Health Record in the OperationDefinition resource \(simplifier.org\).](#)

[The format of the operation URL follows FHIR specifications, and you can read more about it here \(hl7.org\).](#)

The URL is in the following format:

resourceserver/baseR4/Observation/[id]\$/readWithIncludes

- Resourceserver is the service endpoint address. Addresses may vary in different environments.
- BaseR4 is the FHIR version used by the endpoint.
- Observation is the resource type targeted by the operation.
- [id] is the identifier of the resource being requested.
- \$readWithIncludes is the used operation.

8 APPENDIX

Examples related to searches and paging are presented in the appendix.

8.1 Search with page size 100

GET https://phr.xx.kanta.fi/phr-resourceserver/baseStu3/Observation?_count=100&&patient=Patient%2F78bcbd87-4f46-410f-9bd8-32c97131dbf2

8.2 Paging links in the search result

The paging links are for the current page in the “**self**” section and for the next page in the “**next**” section. The link to the previous page is shown on the next pages of the search result in the section “**previous**”.

8.2.1 Example of the first search result page

```
{  
  
  "resourceType": "Bundle",  
  
  "id": "a940d606-9c15-4af4-9e64-8d2dc8bf6818",  
  
  "meta": {  
  
    "lastUpdated": "2020-03-31T14:59:13.589+03:00"  
  
  },  
  
  "type": "searchset",  
  
  "total": 5,  
  
  "link": [  
  
    {  
  
      "relation": "self",  
  
      "url": "http://phr.xx.kanta.fi:9082/phr-  
resourceserver/baseStu3/Observation?_count=50&patient=654af607-6fa8-41e6-a564-  
bde3aa948e6d"  
  
    },  
  
    {  
  
      "relation": "next",  
  
      "url": "http://phr.xx.kanta.fi:9082/phr-  
resourceserver/baseStu3?_getpages=a940d606-9c15-4af49e64-
```


