DPV - HL7 import interface

Andreas Hungele Ramona Ranz

As of 21/11/2024 - DPV version 7.50.095

Contents

Chapter 1

Introduction

In DPV, we offer all participating centres a HL7 interface for data transfer. Thanks to a manufacturer-independent solution, we can provide the interface free of charge. Both patient level and visit level data (e.g. laboratory values, diagnoses) can be imported via the interface. The interface can process HL7 messages of the standards 2.2, 2.3, 2.4 and 2.5.

1.1 Calling the import

The menu item Data exchange > HIS/PMS import can be used to import both patient level data and visit level data from HL7 files. The data of several patients can be imported simultaneously.

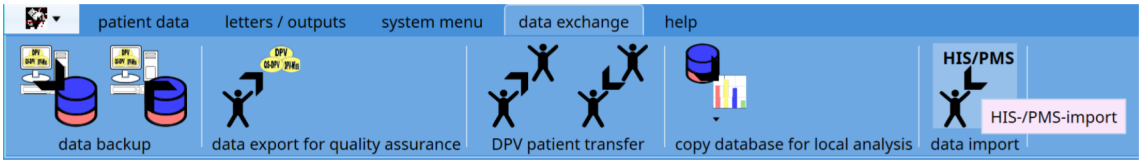

Figure 1.1: data exchange - menu

1.2 Import mask

The import mask is divided into two areas. The menu contains the buttons used to control the import of the HL7 data. The mask lists all patients and their visit level data found in the HL7 files.

Figure 1.2: Import mask

The following buttons are available in the menu:

reload data prepared from the import service

select all patients

import selected patients

Chapter 2

Import settings

To configure the HL7 interface, some settings must be made in the DPV import settings beforehand. The import settings can be accessed via the menu item „Import settings“ in the system parameters (menu item „System menu“).

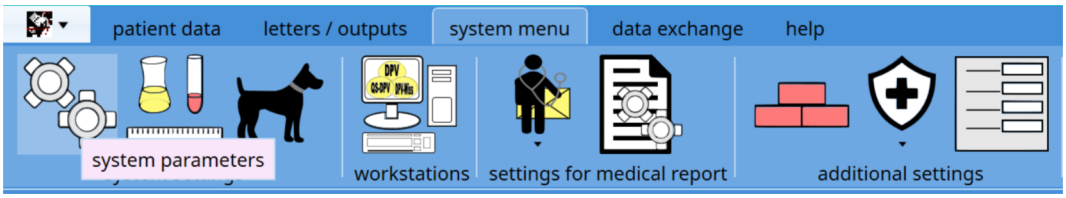

Figure 2.1: system parameters in menu system settings

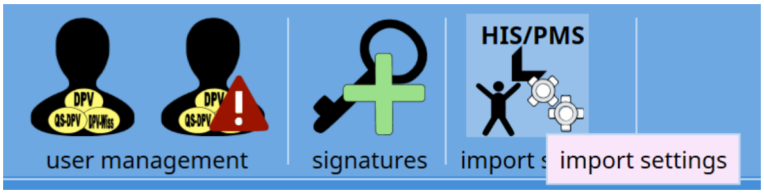

Figure 2.2: import settings in the system parameters

2.1 General settings

The following settings are required for the import. These settings can be found on the first tab:

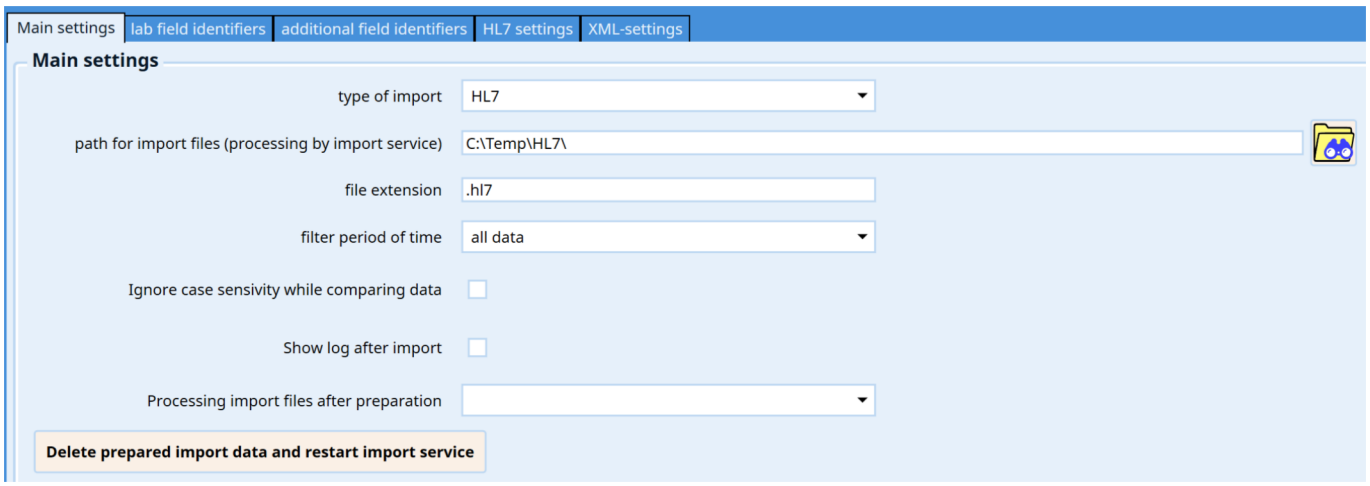

Figure 2.3: Main settings of the import settings

- **type of import**: HL7
- **path of import files (processed by import service)**: Path in which the import service processes HL7 files - path is specified from the perspective of the DPV server
- **file extension**: extension of the HL7 files

The main settings can also be used to specify whether upper and lower case should be considered when the data is compared during import and whether the import log should be displayed after the import. You can also specify whether the HL7 files should be deleted or moved to another directory after being processed by the import service.

With the button „Delete prepared import data and restart import service“ all prepared import data can be deleted and the import service restarted.

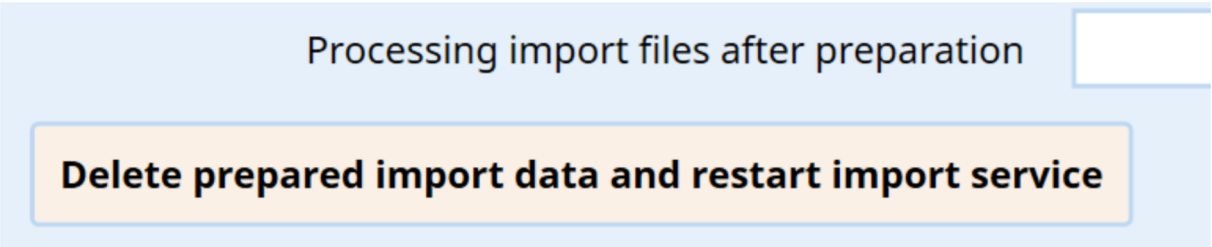

Figure 2.4: Button to restart the import service

2.2 Laboratory field identifiers

In order to import laboratory data correctly, it is necessary to assign the field identifiers of the laboratory values to the field identifiers of DPV. The assignment can be made on the second tab. As DPV is a specialised software for documenting patients with diabetes, only laboratory values associated with the disease diabetes are available for

entry in DPV. Laboratory values that have not been assigned to a DPV field, or for which there is no assignment, are saved in the free text field „additional examinations“.

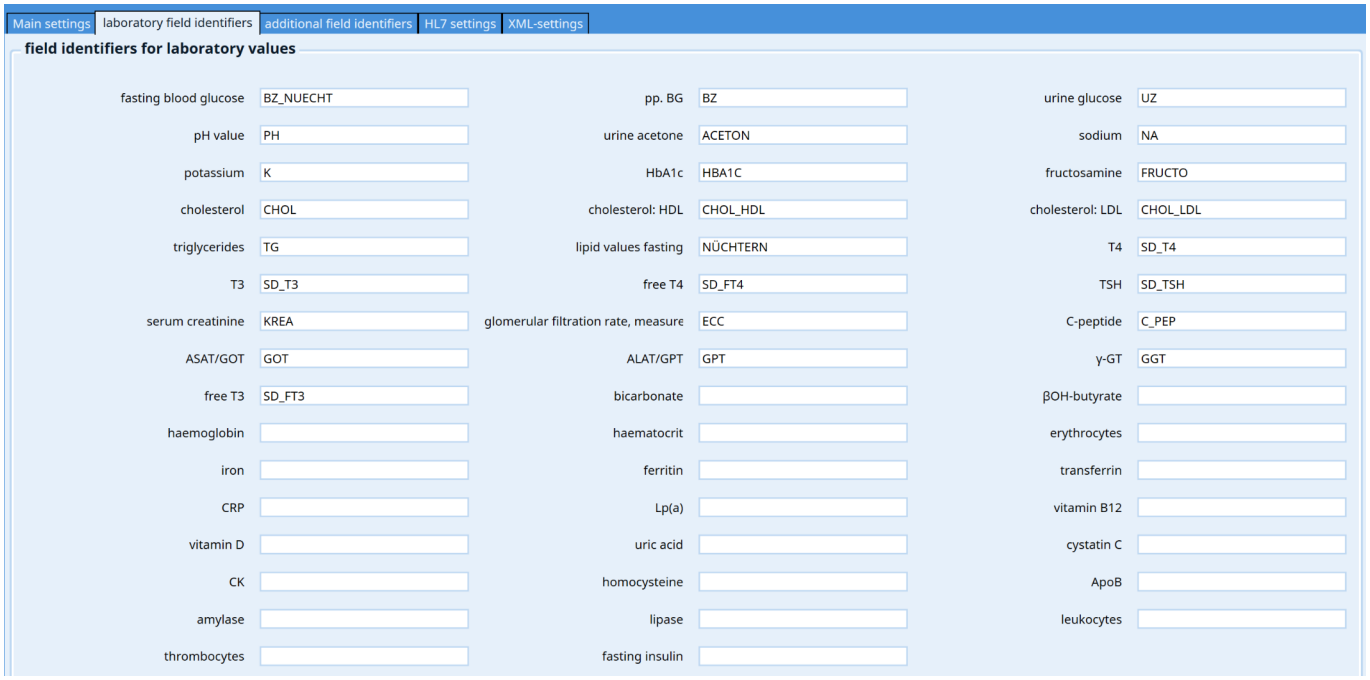

Figure 2.5: Assignment of laboratory field identifiers in the import settings

We gladly assist you with the assignment of the laboratory identifiers.

2.3 Additional field identifiers

If other information (e.g. height, weight, blood pressure) is transferred in the same structure as the laboratory data in addition to the laboratory values, the corresponding field identifiers can be entered on the third tab.

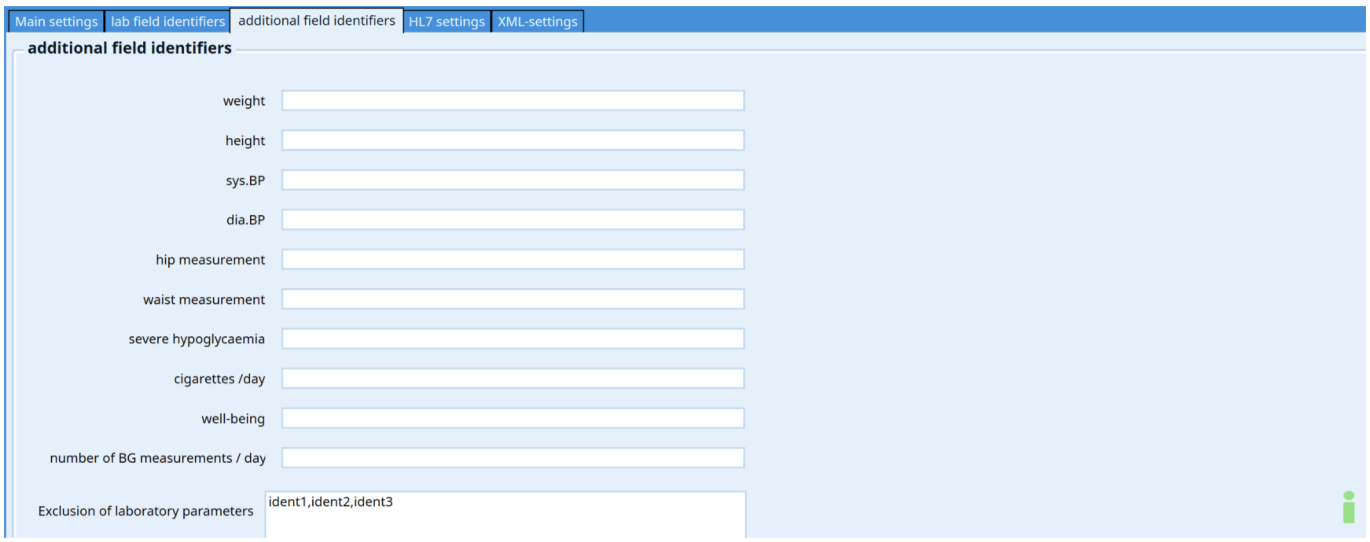

Figure 2.6: Assignment of additional field identifiers in the import settings

In DPV, some laboratory values are not saved directly in the database, but are only calculated from other entries if required (e.g. eGFR, MCV, MCH, MCHC). If these values are transferred to DPV via the interface, the values are saved in the free text field „additional examinations“ due to the lack of assignment to a DPV field and are therefore included several times in the medical report, among other things. The processing of these values can be prevented via the entries in the field „exclusion of laboratory parameters“. Field identifiers that should not be processed can be stored in the input field, separated by a comma.

2.4 HL7 settings

If it is not possible to filter the data via the HIS, different filters can be defined in DPV for the data to be imported.

The following filters are available:

- **only patients with diagnosed diabetes**: Only patients who have a diabetes diagnosis in the DG1 segment are imported. The following assignment is made:

E10	type-1 diabetes
E11	type-2 diabetes
E13	other specified diabetes mellitus
O24.4	diabetes mellitus, occurring during pregnancy
R73	abnormal glucose tolerance test (type 0)

- **sending facility**: Filtering on the sending facility. Filtering takes place after the 12th item of the ORC segment

- **Only display patients with ADT messages**: During the HL7 import, DPV processes both ADT messages (e.g. patient level data) and in ORU messages (laboratory data). Laboratory messages from patients who do not have diabetes and are not cared for by the institution can theoretically be transmitted via the laboratory system. If only patients who are known to DPV or for whom ADT messages are available are to be displayed for selection in the import module, the option „only display patients with ADT messages“ must be activated.

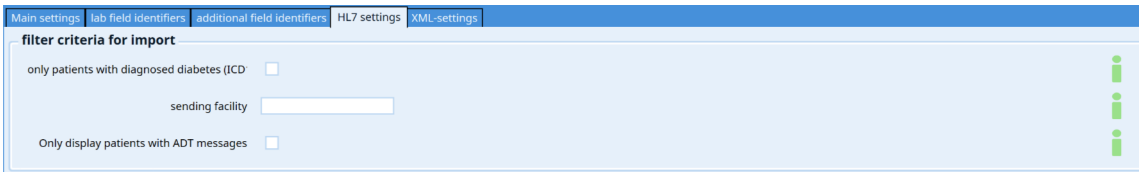

Figure 2.7: HL7 settings - filter criteria for import

The HL7 standard does not define a fixed position for several details of the recipients of medical report (e.g. address, title, salutation). Via the „HL7 settings“ tab, you can specify the position of the information in your HL7 messages.

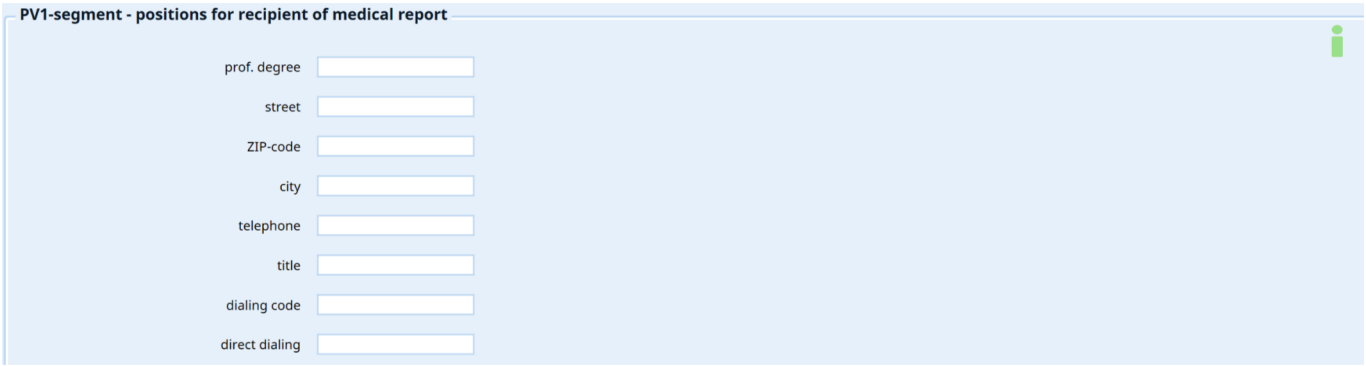

Figure 2.8: Information for the positions in the PV1 segment

Chapter 3

Data preparation

The data from the HL7 messages is transferred to the DPV database in several steps.

In the first step, the HL7 messages provided are automatically processed by an import service. The import service is installed together with the DPV server component. The import service automatically prepares the HL7 messages in the exchange directory every 5 minutes. The processed data is saved in a copy of the DPV database in the directory QS_Ulm ▸ DPVc ▸ DPVcServer ▸ Datenbank ▸ temp ▸ dpvimport ▸ <<signature>>.

In the next step, the user selects the patients to be imported into the DPV database. As data in the import data can be changed in this step (e.g. adding missing fields, assigning patients), the selection of the patients is processed in a second copy of the DPV database in the directory QS_Ulm ▸ DPVc ▸ DPVcServer ▸ Datenbank ▸ Daten ▸ <<signature>> ▸ Import.

After selecting the patients, the data can be imported into the DPV database. This involves a comparison with existing data. After the data has been imported, the temporary directory used by the user to select the patient data is emptied. The next time the import service is run, the data prepared in the meantime is made available to the user for the next import.

3.1 Component service DPVVfp Com+ Anwendung

The actual processing of the HL7 messages is carried out by the component service „DPVVfp Com+ Anwendung“, which is set up together with the DPV server. By default, the component service runs via the Windows internal system account „LocalSystem“. When deleting or moving the exchange messages after processing, problems may occur, if the messages are located in a shared network folder. In this case, the Windows internal system account „LocalSystem“ does not have the necessary privileges. Alternatively, you can run the component service via a separate user account. Please note that the user account will be overwritten with the default user account when programme updates are installed.

You can access the component service either via the „Run“ dialogue (+ R) and the

command „comexp.msc“ or the Windows search (⊞ + S) and the search term „component services“.

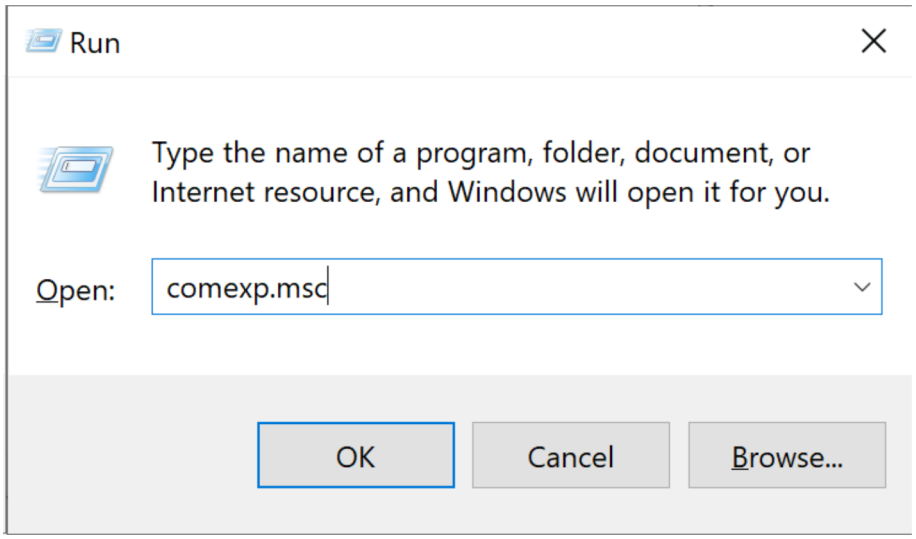

Figure 3.1: Calling the component services via the „Run“ dialogue

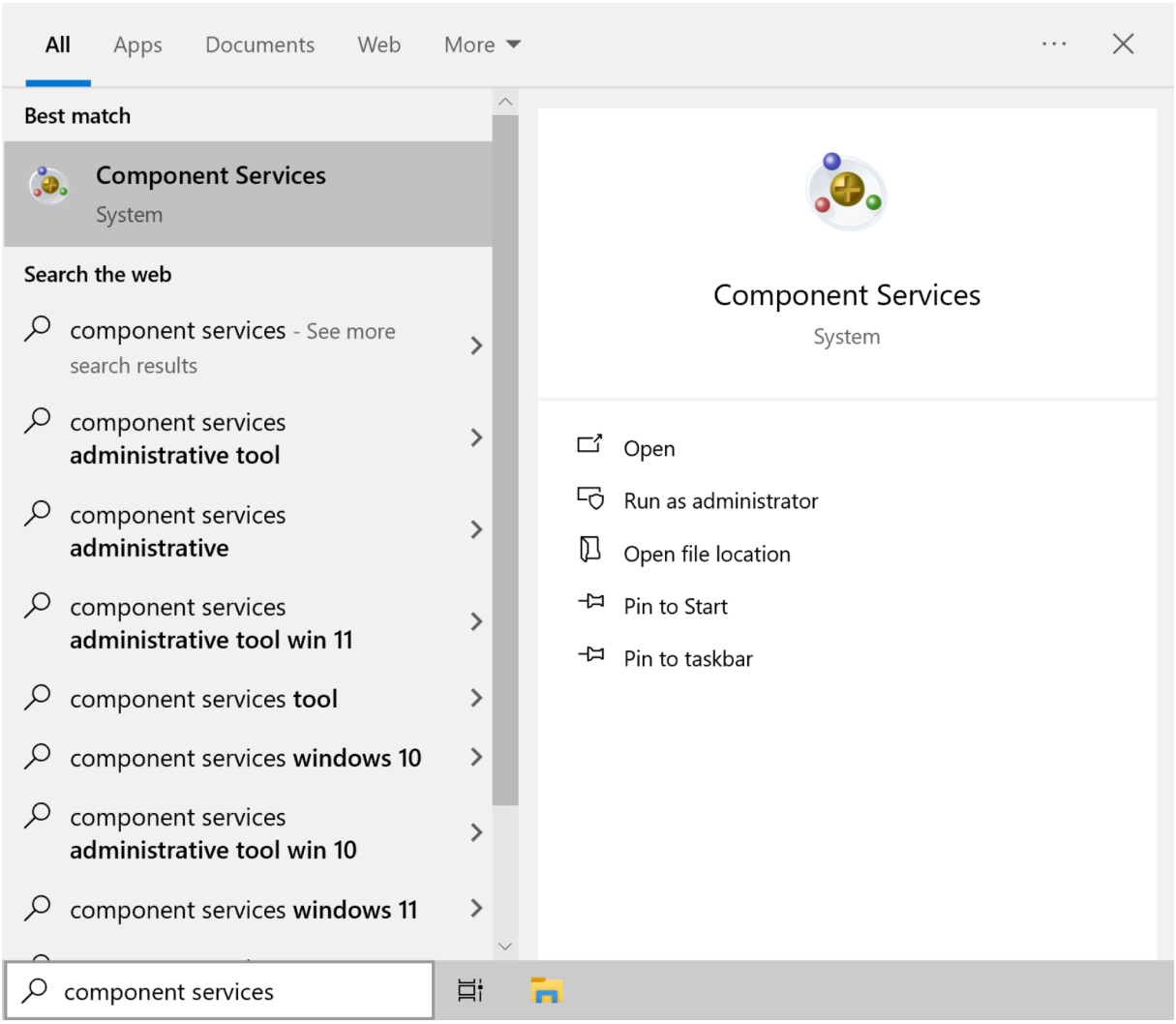

Figure 3.2: Calling the component services via Windows search

The DPVVfp Com+ Anwendung component service can be found under Console root › Component services › Computers › My Computer › COM+Applications.

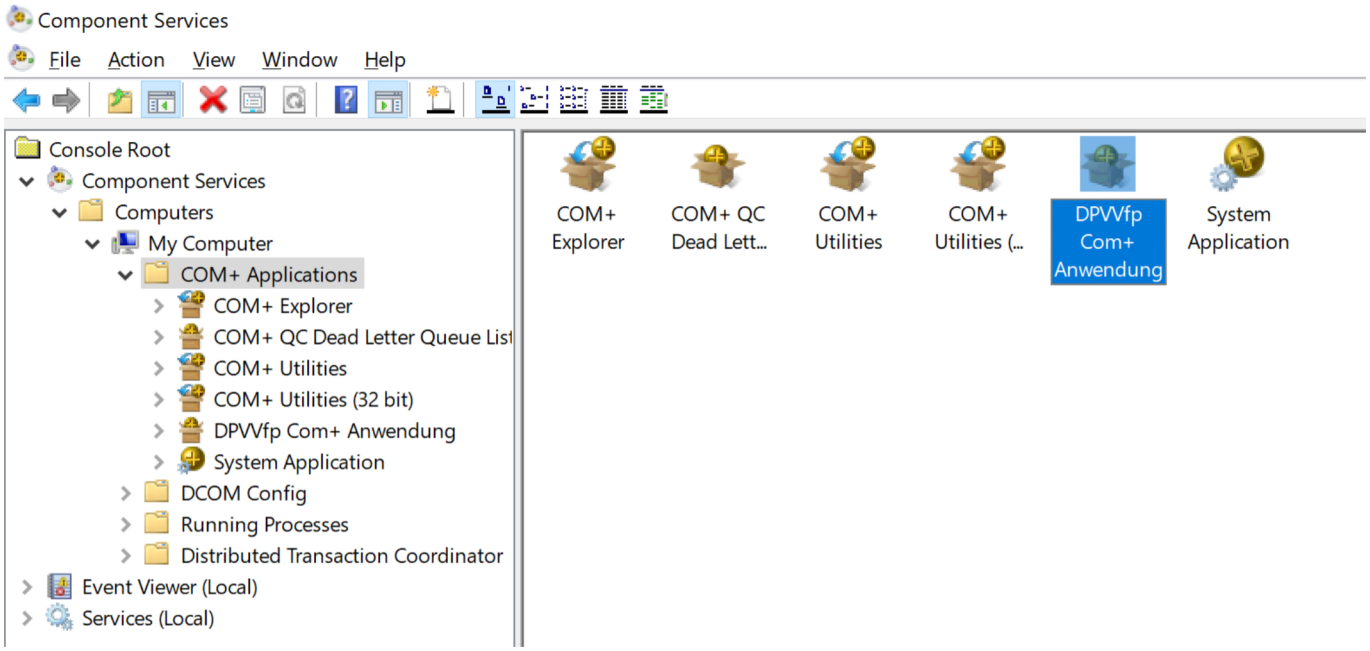

Figure 3.3: DPVVfp Com+ Anwendung in the component services

The user account via which the component service runs can be changed via the sub-item „Properties“ in the context menu via the „Identity“ tab. Please enter the user and the corresponding password via the option „This user“.

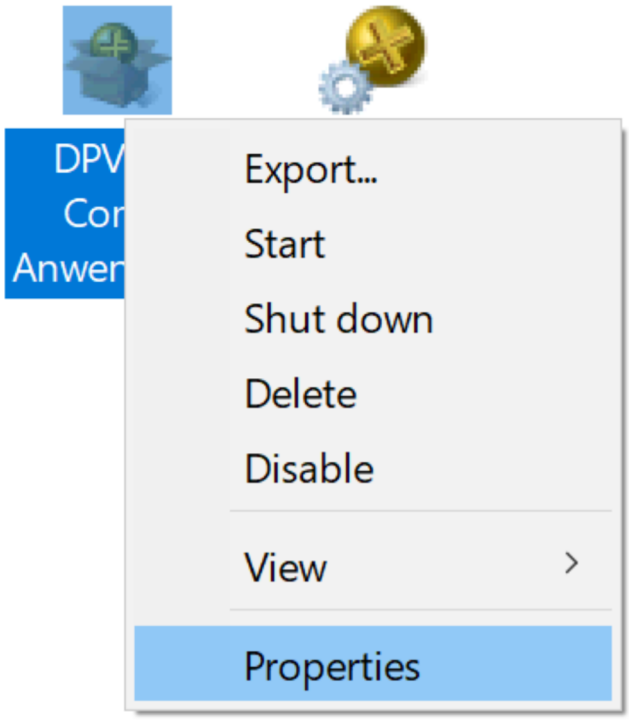

Figure 3.4: Properties option in the context menu of the component service

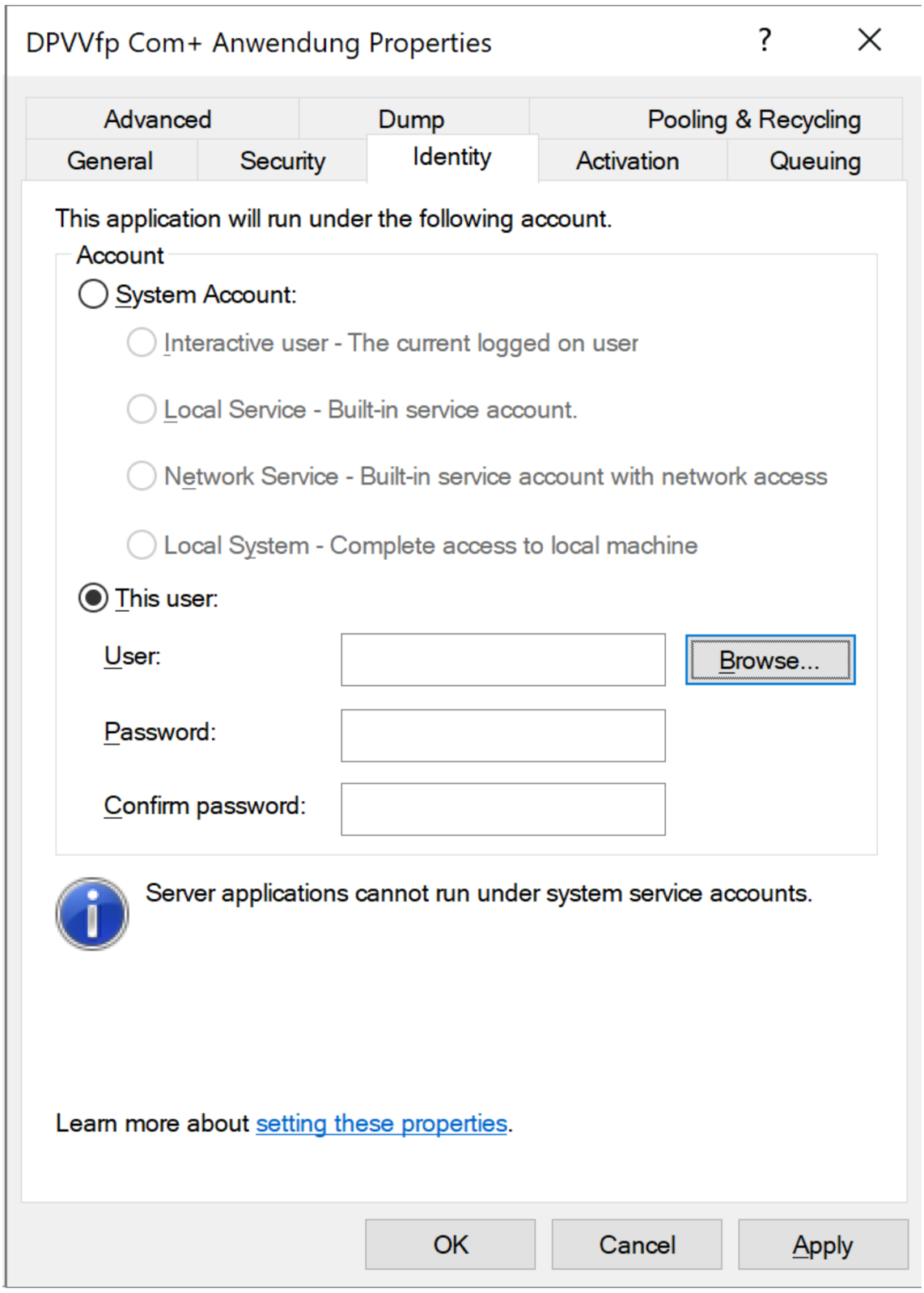

Figure 3.5: Identity tab in the properties with user settings

After customising the user, the component service must be restarted for the changes to take effect. You can restart the component service via the context menu. To do this, first stop the component service using the „shutdown“ option and then restart it using

the „start“ option.

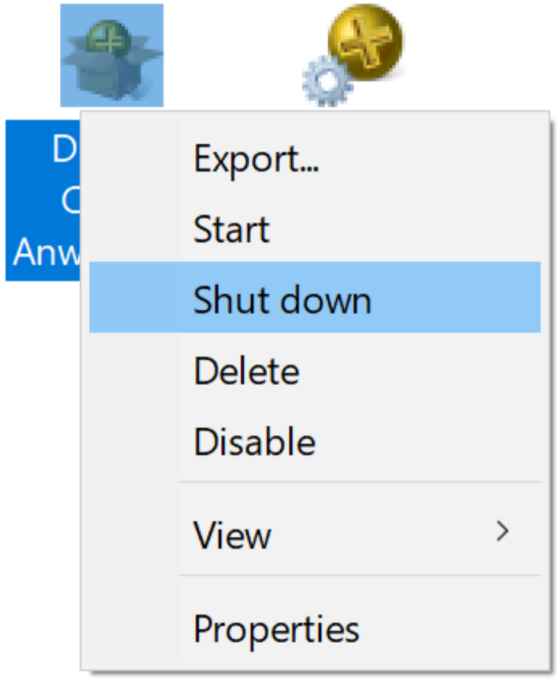

Figure 3.6: Restart the component service via the context menu

Chapter 4

Preparation for import

Once the HL7 messages have been prepared, the data can be imported into the DPV database via the menu item Data exchange > HIS/PMS import.

4.1 Patient list for import

When the import window is opened, all patients available for import are listed directly.

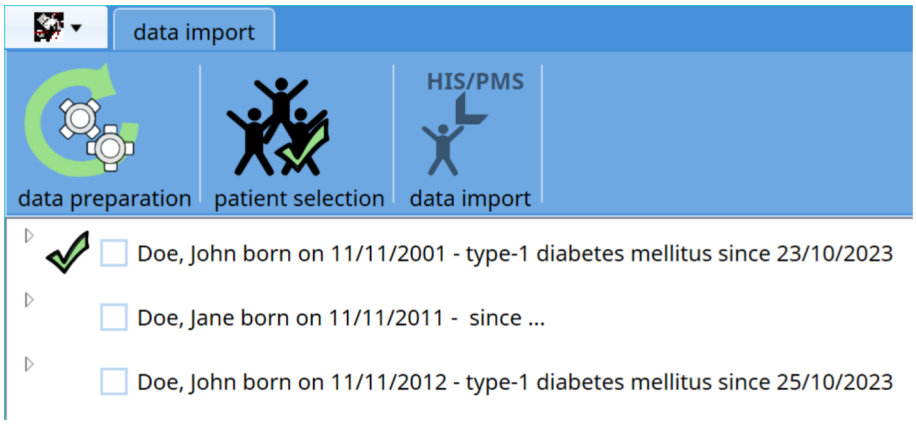

Figure 4.1: List of patients that can be imported

Click on the triangle to the left of the patient's name to list the visit level data available for import.

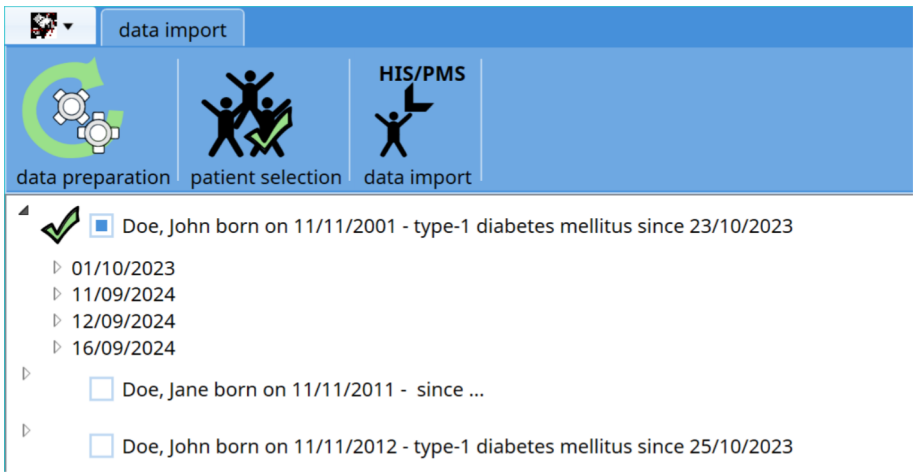

Figure 4.2: Patient with listed visits

The values that are imported for a visit can be listed by clicking on the triangle to the left of the examination date.

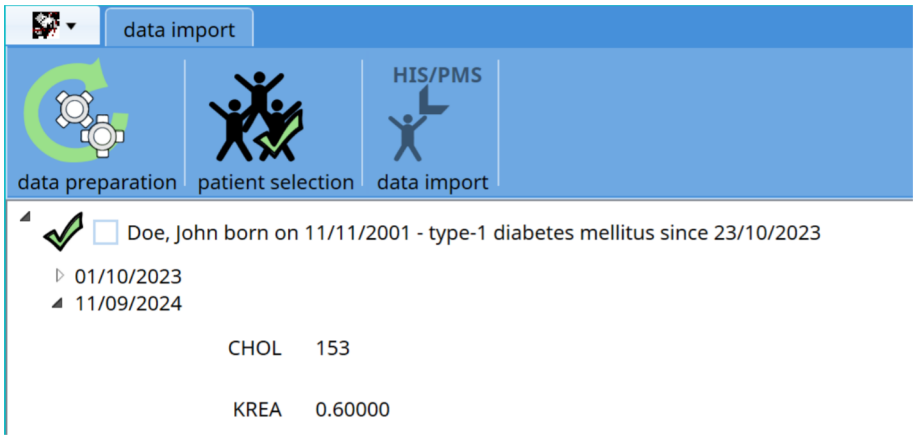

Figure 4.3: Patient with listed values

4.2 Selection of patients

Patients to be imported can be selected by clicking on the checkbox in front of the patient name.

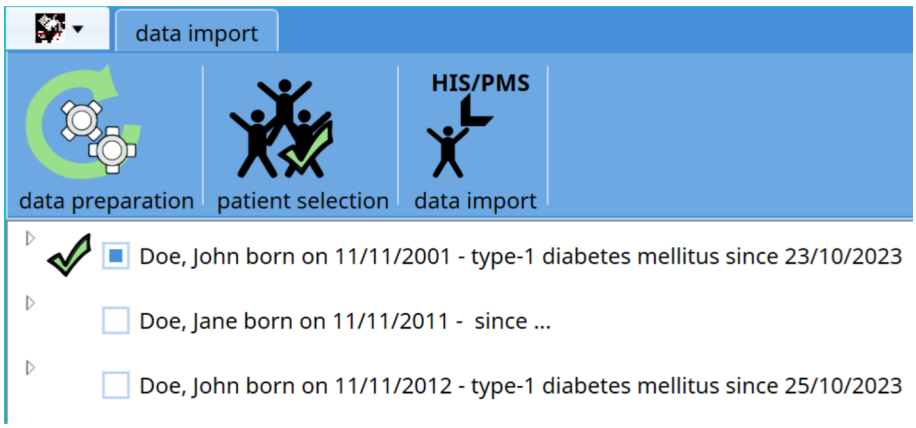

Figure 4.4: Manually selected patient

In addition, all patients can be selected in the menu using the button „select all patients“.

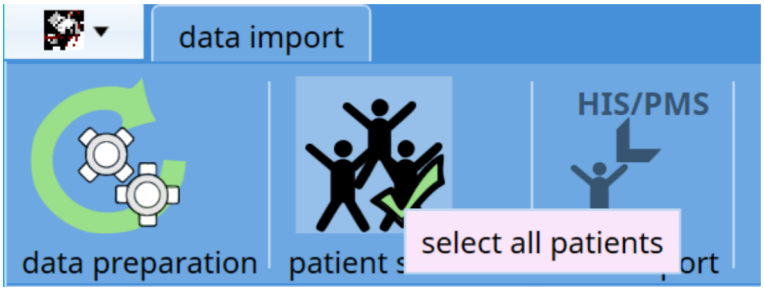

Figure 4.5: Button in the menu for selecting all patients

It is not possible to select the visits or values to be imported. All visits are always imported into the DPV database with the values stored in each case.

The data of the unselected patients is irretrievably deleted after the import. The patient data will no longer be available for the next import. When importing, you should therefore always import all the desired patients directly.

4.3 Assignment of patients

When a patient is selected, it will be checked directly whether the patient already exists in the DPV database. DPV first checks whether an assignment is possible using certain criteria (e.g. name, address, date of birth, gender). Depending on the number of matching characteristics, the patient is assigned automatically or a query is made as to whether the patients are the same. The decision as to whether the patients are the same must then be made by the user.

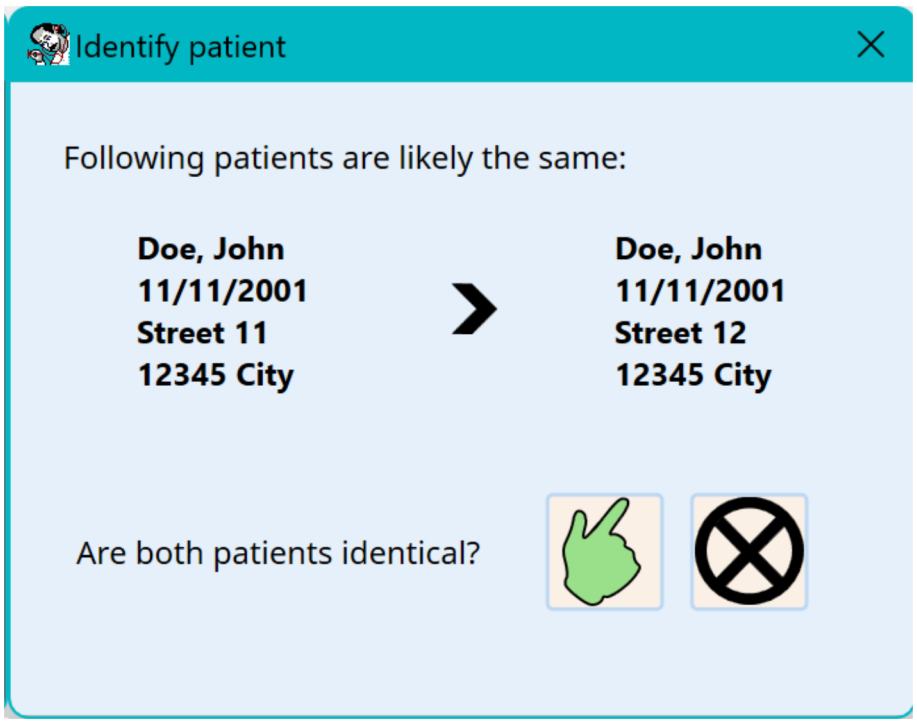

Figure 4.6: Demand for assignment of similar patients

For patients who cannot be automatically assigned to an existing patient in DPV, a dialogue appears in which the assignment can be made manually.

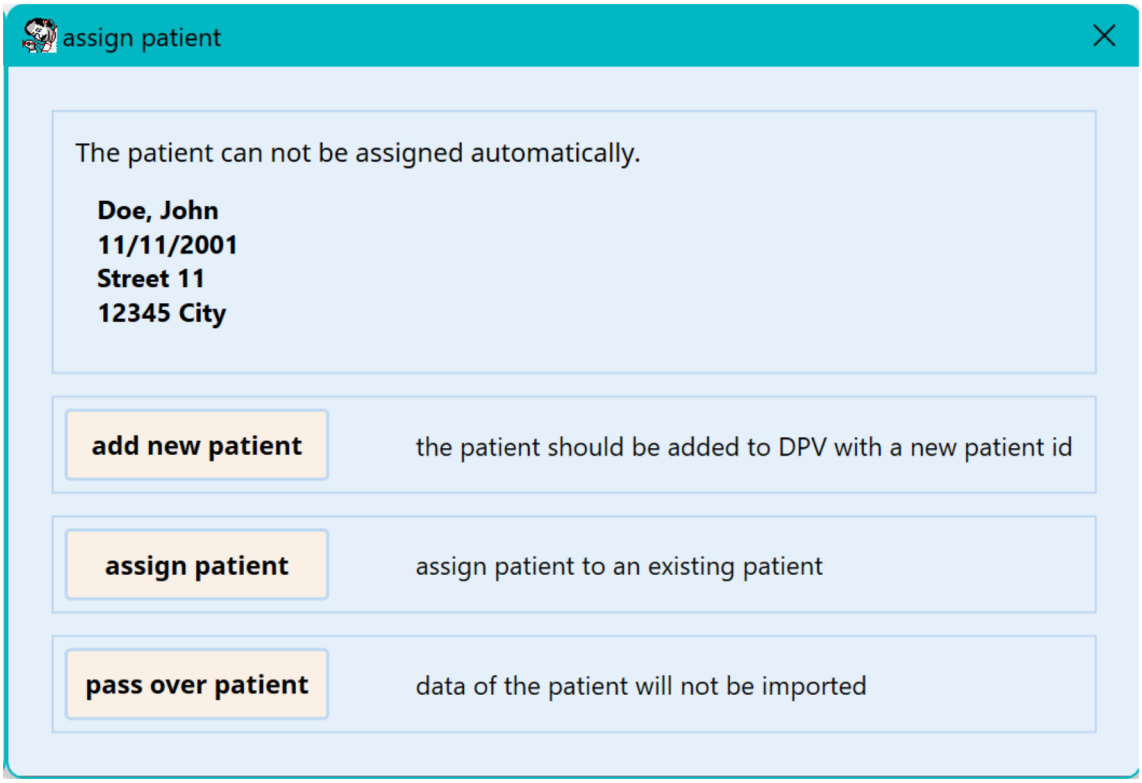

Figure 4.7: Manual assignment of patients

The following options are available:

- **Add new patient**: The patient is newly created in the DPV database
- **Assign patient**: The patient can be assigned to an existing patient. A list of existing patients opens from which a patient can be selected.
- **Skip patient**: The selection of the patient is cancelled. The patient's data is not imported.

If the patients are selected via the „select all patients" button in the menu, two additional options are available when assigning new patients:

- **add all if necessary**: All patients that cannot be assigned automatically are newly created.
- **Cancel patient selection**: The selection of patients is cancelled. No further patients are selected.

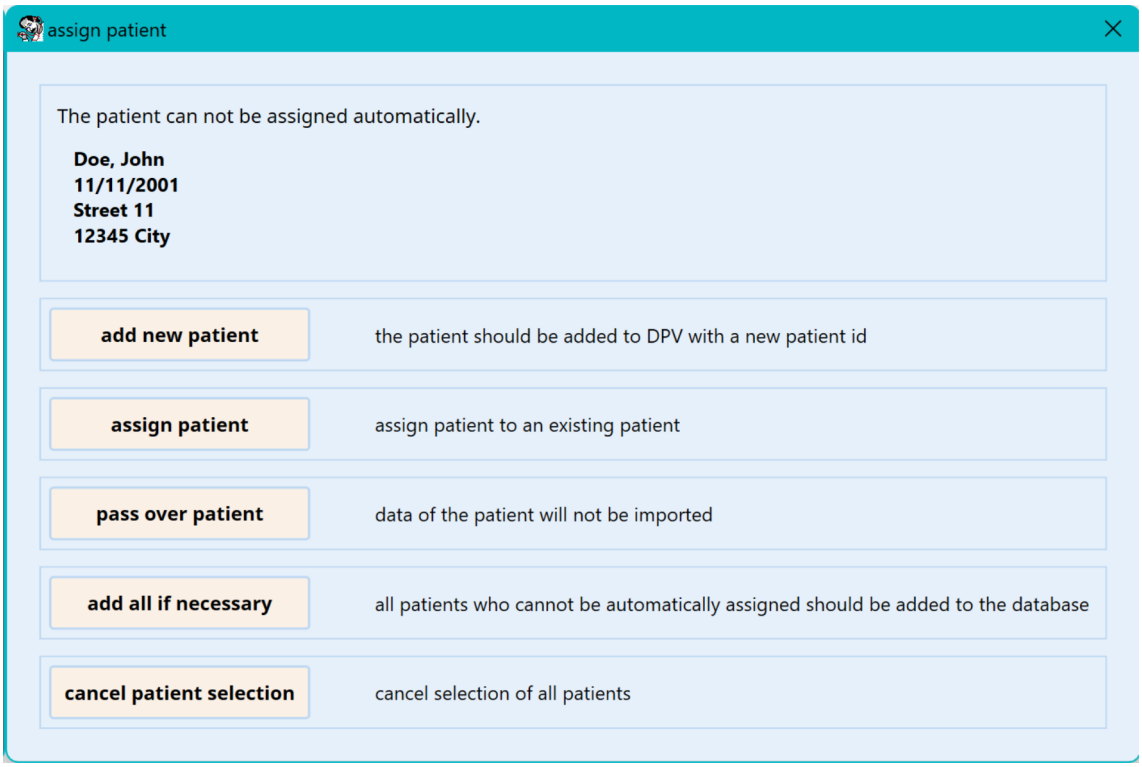

Figure 4.8: Manual assignment of patients when called via the menu

Once the patient has been assigned, the patient's patient number from the HIS is saved in DPV. For future patient imports, the assignment is then made directly via this patient number from the external system.

The external patient number can be viewed in the patient level data and can also be entered manually.

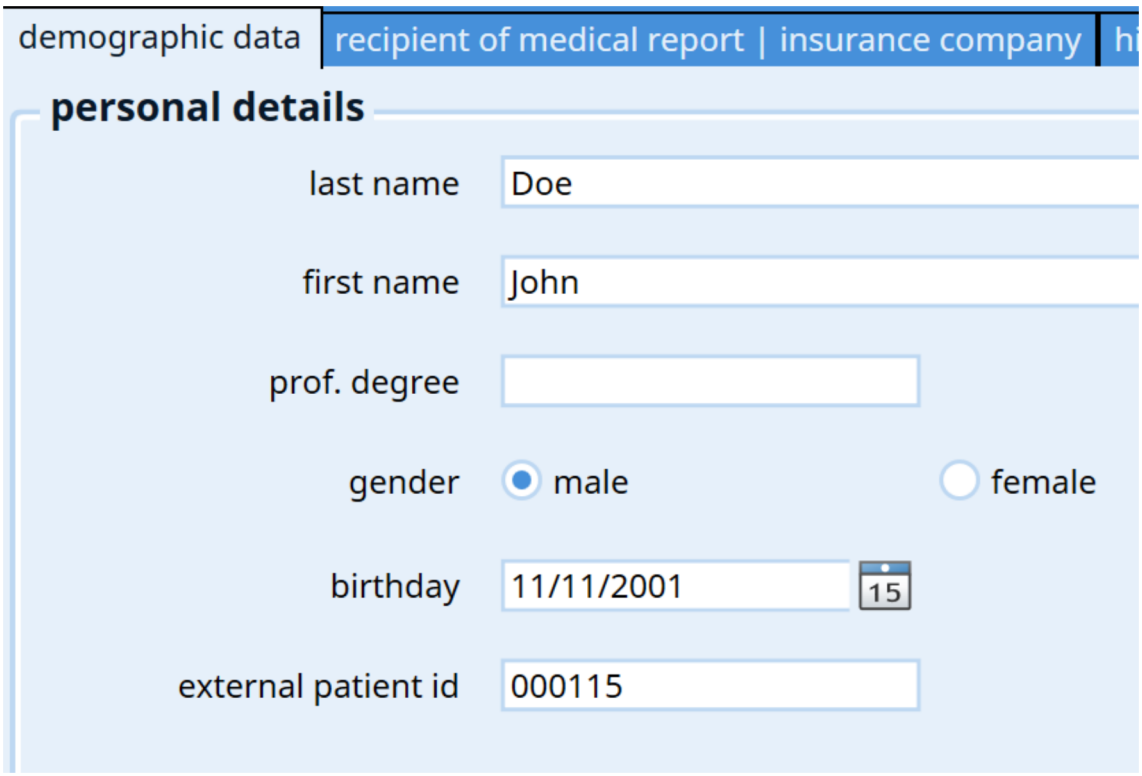

Figure 4.9: external patient id in the patient level data

4.4 Mandatory fields for the import

As DPV is a specialised software for patients with diabetes, only patients with a diabetes diagnosis can be imported. For new patients, the diabetes type (DG1 segment) is therefore searched for in the HL7 data. If there is no diabetes diagnosis when the patient is selected, DPV asks for it directly. The same fields are available as in the patient level data.

Figure 4.10: Demand for missing diabetes type

The situation is similar for gender. If this is not available, the gender is requested when the patient is selected.

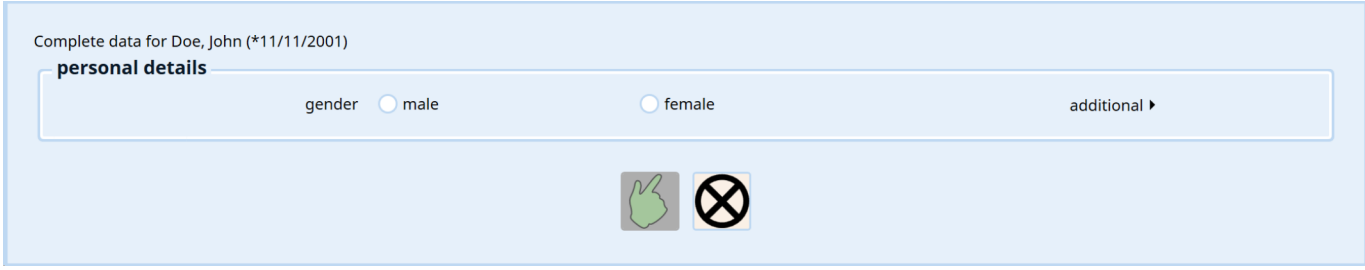

Figure 4.11: Demand for missing gender

Chapter 5

Importing the data

5.1 Data import

Once the desired patients have been selected, the data can be imported. This is done via the „data import“ button in the menu. Once the import is complete, the import window is closed again.

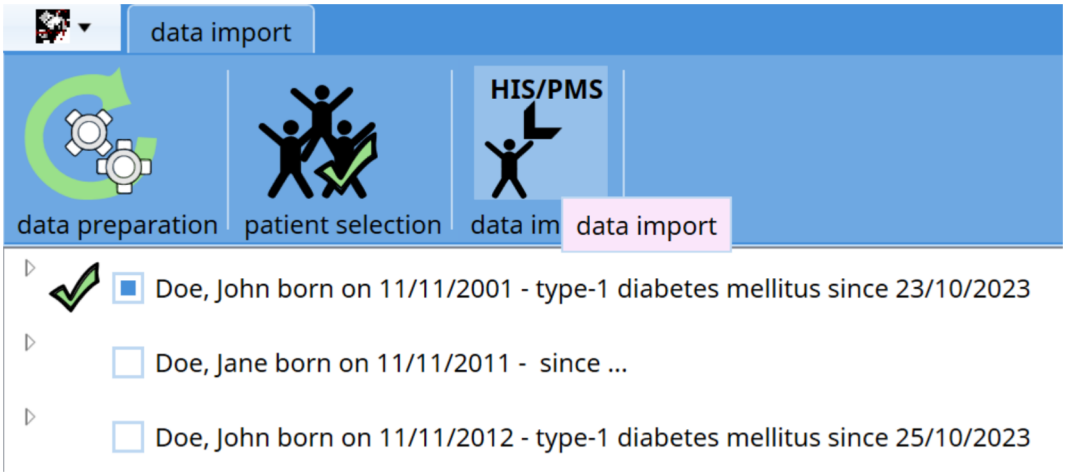

Figure 5.1: Call data import

5.2 Conflicts during import

If a patient’s data to be imported differs from the existing data in DPV, a prompt appears in DPV asking how the data conflict should be handled. This may be a change of address (patient moves) or laboratory values documented in DPV that differ from the laboratory values in the import files. The corresponding patient and the differing values are then displayed.

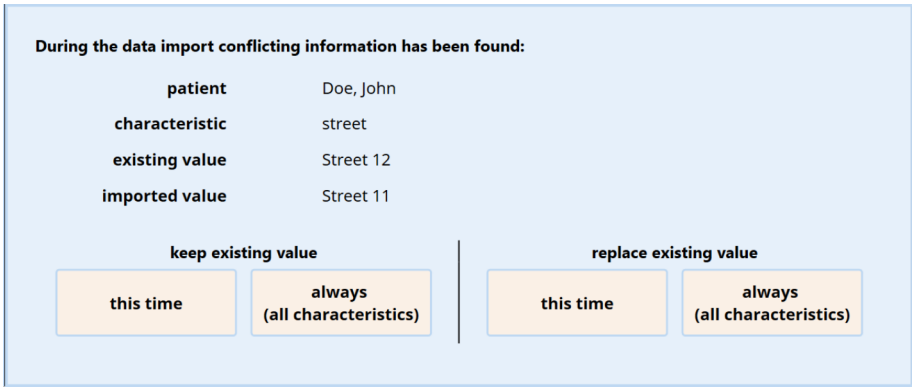

Figure 5.2: Conflict in the patient level data

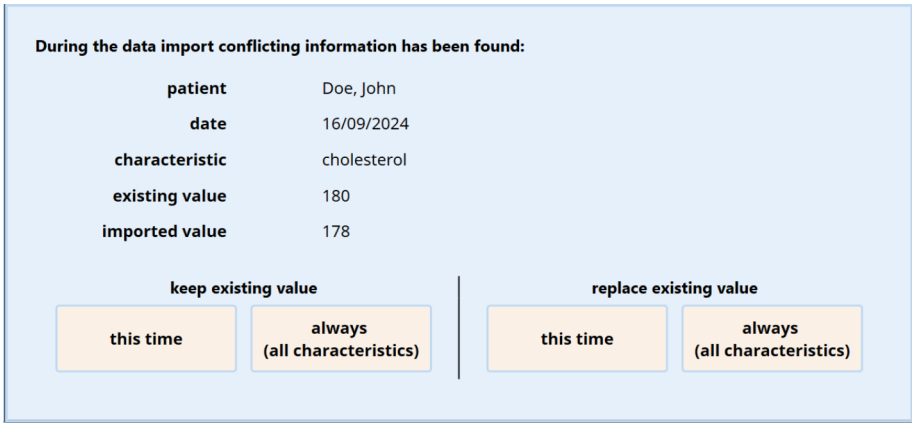

Figure 5.3: Conflict in the visit level data

The following options are available for resolving the conflict:

- **keep existing value - this time**: the existing value in the database should be kept once
- **keep existing value - always**: The existing value in the database should be kept for this and all subsequent conflicts
- **replace existing value - this time**: the existing value in the database should be replaced once with the value from the import
- **replace existing value - always**: the existing value in the database should be replaced with the value from the import for this and all subsequent conflicts

5.3 Import log

After the import it is possible to view an import log. The log is displayed in a separate window within DPV.

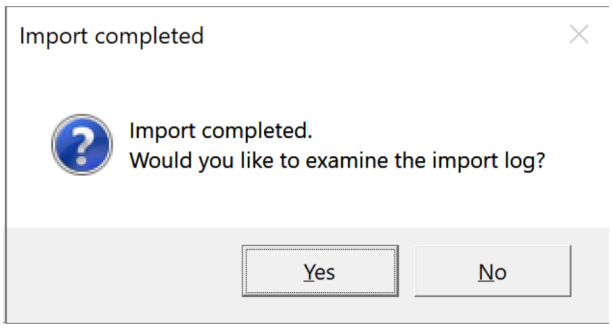

Figure 5.4: Request whether log should be displayed

All imported patients and their data are listed in the log. The processing of data conflicts is also listed in the log.

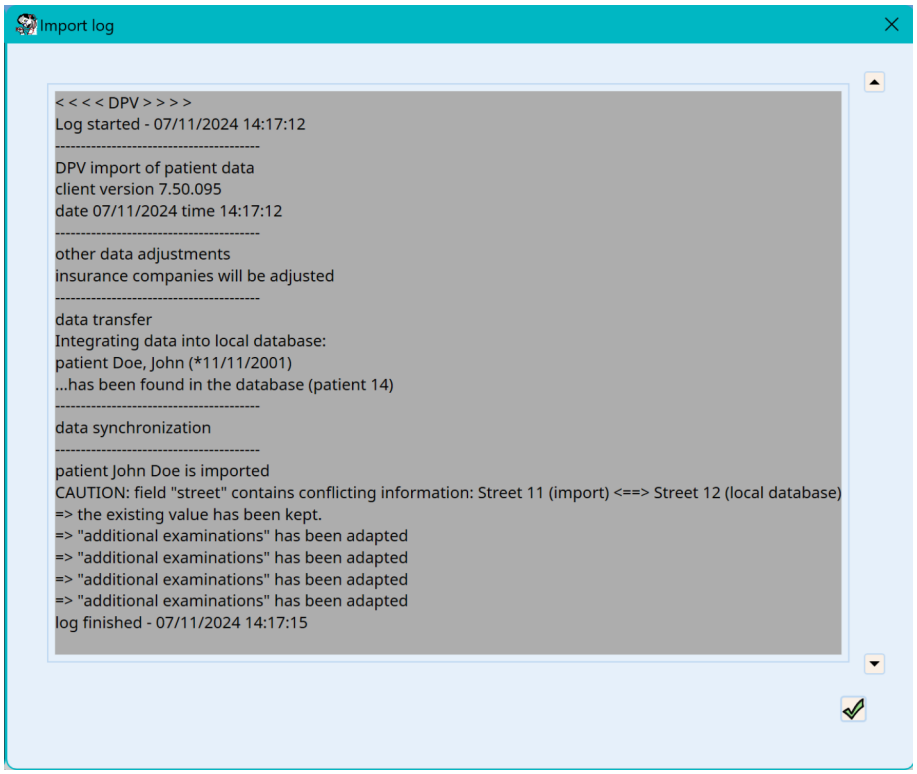

Figure 5.5: Display of the protocol

Chapter 6

HL7 segments

6.1 PID

The data in the PID segment is assigned to the patient level data.

position	subposition	DPV field
3	1	external patient id
5	1	surname
5	2	first name
5	5	prefix
5	6	title
7		date of birth
8		sex
11	1	street
11	3	city
11	5	postal code
11	6	country
13		phone number

- **HL7 versions 2.3, 2.4, 2.5**:

position	subposition	DPV field
29		date of death

6.2 IN1

Data from the IN1 segment is assigned to the patient level data. DPV attempts to read out the health insurance data. As this cannot be mapped one-to-one in HL7 format, it is possible that the data will not be imported in full.

position	subposition	DPV field
3		insurance company ID
4		insurance company
5	1	insurance company street
5	3	insurance company city
5	5	insurance company postal code
15		plan type
16	1	surname of insured
16	2	first name of insured
18		insured's date of birth
49		insured's ID Number

6.3 PV1

Data from the PV1 segment is used for two different things. Firstly, DPV attempts to determine the patient's stay from the segment data (outpatient or inpatient admission, admission and discharge date).

DPV also attempts to determine details of the recipients of the medical report. You can customise which items are used to import additional recipient details (e.g. address, telephone number, ...) as described in section 2.4 HL7 settings.

position	subposition	DPV field
2		reason for admission
7	2	last name of attending physician
7	3	first name of attending physician
7	7	prof. degree of attending physician
8	2	last name of recipient
8	3	first name of recipient
9	2	last name of recipient
9	3	first name of recipient
44		date of admission
45		discharge date

6.4 DG1

The diagnoses in the DG1 segment are added to the diagnosis table in a structured manner. The diabetes diagnosis, if available, is also set as a diabetes type in the patient

level data. In the DG1 segment, a distinction is made between HL7 version 2.2 and HL7 versions 2.3, 2.4 and 2.5. The following assignments are made:

- **HL7 version 2.2**:

position	subposition	DPV field
3		ICD key
4		ICD diagnosis
5		date of diagnosis

- **HL7 versions 2.3, 2.4, 2.5**:

position	subposition	DPV field
3	1	ICD key
3	2	ICD diagnosis
5		date of diagnosis

6.5 ORC

The sending facility is used to filter the data from the ORC segment.

position	subposition	DPV field
12		sending facility

6.6 OBR

In the OBR segment, an attempt is made to determine the examination date for the OBX segments.

position	subposition	DPV field
2		placer order number
7		examination date

6.7 OBX

DPV imports the data in the OBX segment into the visit level data. The assignment is made via the laboratory identifiers stored in the import settings. If laboratory values cannot be assigned automatically, they are imported into the field „additional examinations“ (in the form „<<name of the laboratory value>> <<result>> <<laboratory unit>>“). Only laboratory values that have the status „F“ (final) or „V“ (verified) are imported.

position	subposition	DPV field
3	1	ident of the laboratory value
3	2	name of the laboratory value
5		result
6		laboratory unit
11		status
14		examination date