HL7 Family Tree Converter User Guide

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Version 2.00

Empowering Healthcare Connectivity

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Document Revisions

Date	Version Number	Document Changes
11/16/2023	1.00	Initial Draft
12/3/2023	2.00	Revised Draft

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1 Introduction

1.1 Scope and Purpose

Scope:

The proposed program aims to develop a sophisticated tool with the primary objective of reading XML/HL7 files containing patient data provided. The tool will generate a visual list of the patient family tree allowing the user to explore and select different family members. The main focus of this system is to empower users to dynamically reorient the list based on the chosen family member they would like to know about. This will ensure that the identified family member becomes the main center point with the correct assigned ID. The user can then export the file and see the results they want to know that will be located in the file created.

Purpose:

The purpose of this user guide is to provide comprehensive assistance in understanding the full functionality of the XML/HL7 family tree cancer genetics tool. This tool is designed to empower users with the ability to efficiently navigate and test patient data, specifically family relationships that are encoded within the XML/HL7 files. The guide will cover essential workflows and functionalities that will ensure that users/customers can seamlessly integrate the tool into their healthcare analysis processes.

Covered Workflows and Functionalities:

1. ***File Reading and Visualization***
   - *Understanding how to import XML/HL7 files into the program.*
   - *Navigating and being able to interpret the generated list of family members in the new exported file.*
2. ***Selecting and Reorienting Family Members***
   - *Being able to explore the process of selecting different family members within the family output list*
   - *Learning how to reorient the graph with a chosen family member as the new center point such as ID=1*
3. ***Creating New XML/HL7 Files***
   - *A step-by-step guide on generating new XML/HL7 files centered on the chosen family member.*
4. ***User Program Navigation***
   - *Being able to familiarize users with the interface elements of the program for a user-friendly experience.*
   - *Understanding any interactive features in the program so the user can seamlessly explore the patient data.*

Assumptions and Prerequisites:

This user guide assumes that users have a basic understanding of healthcare data and structures, specifically XML/HL7 file formats. It is expected that users are familiar with fundamental concepts related to family relationships in a medical context. Also, the user is expected to understand basic proficiency in using the software tools for data analysis and visualization.

Target Users:

The primary users for this user guide include healthcare professionals, data analysts, and researchers who are involved in the analysis and interpretation of patient data within the family.

This user guide will serve as a guide and dynamic reference to help support users in adapting to new features and workflows introduced in possible updates.

1.2 Process Overview

The XML/HL7 Family Cancer Genetics Program manages the visualization and rearrangement of patient data that is encoded in XML/HL7 files. Specifically focusing on family relationships The software facilitates the following key processes:

1. ***Configure Your Workspace:***
    - *Learn how to install the jar version of the program on the computer.*
    - *Import the XML/HL7 files: Guide users on how to load patient data into the tool.*
    - *Familiarize with Navigation: Help users navigate the basic interface of the program for efficient data exploration.*
2. ***Family Relationships:***
    - *Visualize Family Tree: Instruct users on interpreting the generated family tree list.*
    - *Select Main Patient: Help guide users in selecting the main patient and understanding the initial family tree orientation.*
    - *Exploring Other Family: Demonstrate the process of selecting different family members within the output list.*
    - *Generate New XML/HL7 File: Guide users through the steps to create new XML/HL7 files centered on the chosen family member.*
3. ***Documenting Findings and Actions:***
    - *Exporting Data: Explain how to export or save the new XML/HL7 file with the new reoriented family tree and associated patient data.*
    - *Document Actions: Guide on maintaining a record of actions taken within the tool (optional).*
4. ***Addressing Issues:***
    - *Error Handling: Describe common errors and how to troubleshoot them.*

2 Getting Started

Before delving into the core functionalities of the XML/HL7 Family Tree Program, users need to configure their workspace that will help to run the program on their computers. This involves several key features to set up the initial environment for efficient data exploration.

Requirements/ Conditions:

1. ***Having The Correct XML/HL7 Files:***
   - *Users must first have access to XML/HL7 files that contain the patient data they want to know about.*
   - *The file formats must comply with the expected structure for successful import.*
2. ***Have Java 21 on your computer:***
   - *Make sure that you have the correct version of Java downloaded to run the program.*
   - *The correct version can be downloaded with this link: https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.exe*
3. ***Have the converter program downloaded to your computer:***
   - *The program is the most important asset to this program. Make sure that you download the program to your computer.*
   - *The program should be provided to you already. If you do not have the program downloaded yet or do not have the program, contact the lead developer or co-developers to receive the download file.*

This initial configuration process lays the foundation for subsequent workflows, ensuring that users can interact and use the program through the XML/HL7 family tree tool. The successful completion of this configuration is essential for an optimal user experience throughout the tool's use.

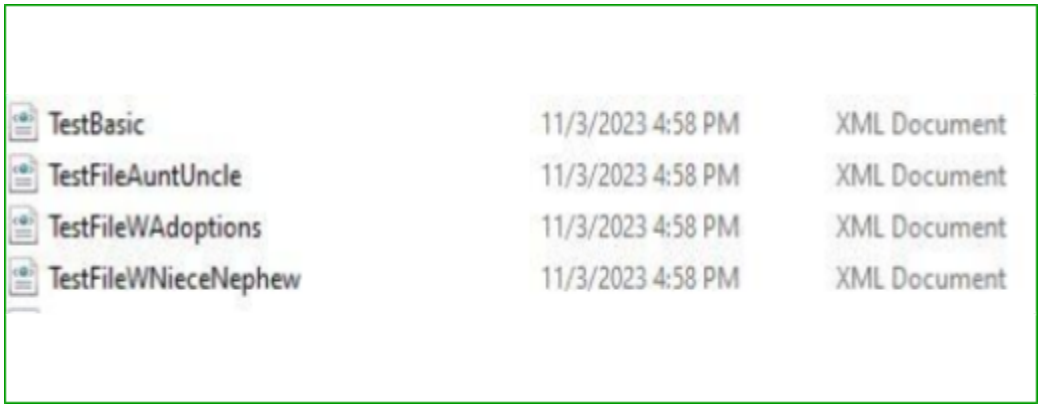
2.1 XML/HL7 Files: Make Sure You Have The Files On Your Computer

The program runs only correctly formatted XML/HL7 files. The files that this program will need should already be premade and ready to be placed into the program.

To check and make sure these files are in your computer you will need to find the correct files in your computer files. To find these will be shown below.

2.1.1 XML/HL7 Files: Finding The Files

1. You will want to go to your yellow files folder on your computer at the bottom of your computer.
2. Click on it to load the application and go to your “downloads” folder (it should have the blue downward arrow).
3. Once you have opened the “downloads” folder, you should be able to see your XML files. They are labeled similarly to this: “ExampleText”. Below is a photo for better reference.



4. Double-click on them to make sure that they open correctly. From there you should be able to see the code. If your code looks something similar to this then you're ready for the next step.

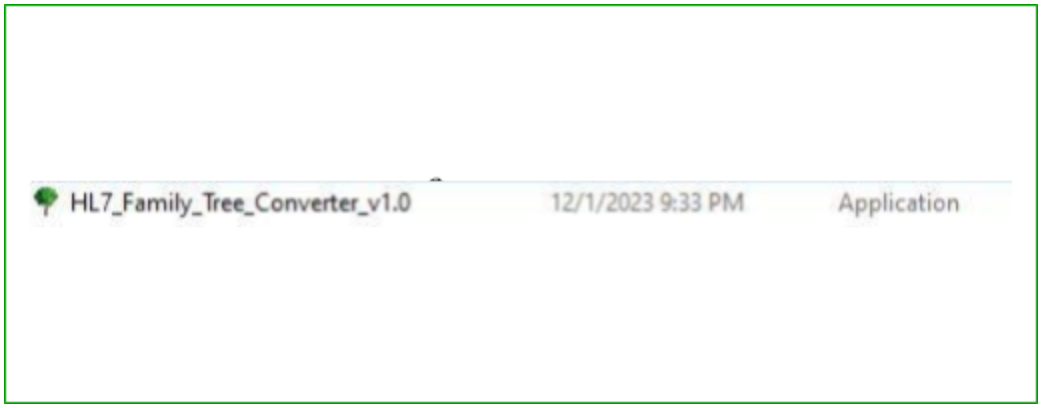
NOTE: If you DO NOT have the correct files, you will want to contact either your company or one of the program developers.

2.2 The Main Application:

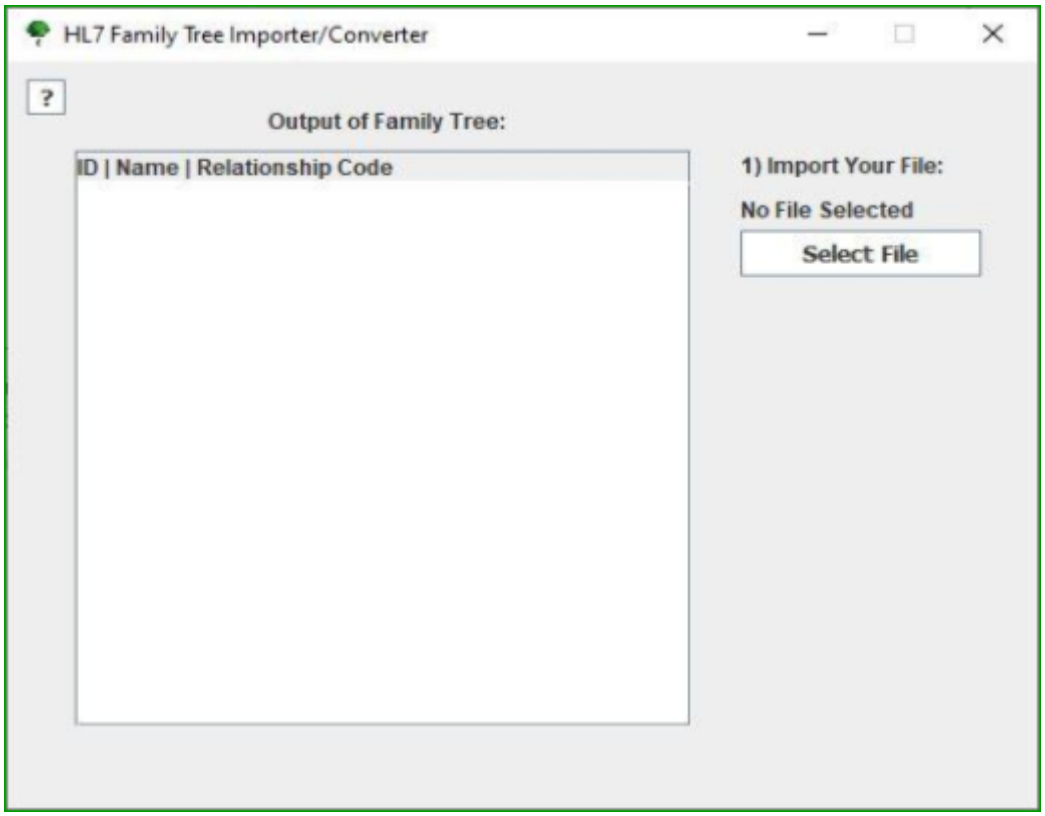
There are two options when installing the converter. The .exe file is the main application which should already have been provided to you, while the .jar version is a backup contingency if the application were to not function. While there are no steps to install the program since it will be provided to you the basic file must be presented for the user to know the difference.

2.2.1 Knowing if you have the main application

1. The main file for the application is a .exe file. This is the main program you will want to run. Simply take the file sent to you and download it onto your device.
2. You will then open your internal storage where you will see a file that looks like this below.



3. You will simply open the file and the application should then open and send you straight to the main menu.



NOTE: If your PC pops up with a blue screen that says "Unknown File" simply select "More Info" and then select "Run Anyways". The computer will then be able to open the application.

2.3 Java 21: Make Sure You Have Java 21 Installed On Your Device For the .jar File

The program requires that Java 21 from Oracle is downloaded and installed onto your computer. The Java program will run through the browser and be downloaded off the website. To find the link look below in the steps provided.

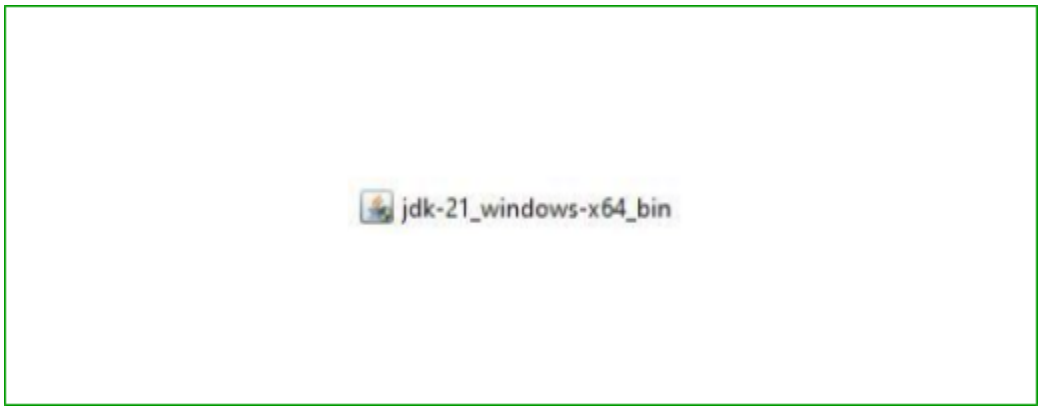
2.3.1 Java 21: Installing The Correct Version Of Java

1. There are many different versions of Java, however, only one version will be able to run this program correctly. You will first want to use this link to install Java 21: https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.exe
2. You will be redirected to the page that you can see below:

3. Your computer will automatically begin to download the program seen with the blue download arrow in the top right corner of your screen next to the search bar.

2.3.2 Java 21: Where To Locate The Program

1. Once Java has been installed, you will want to go back to your yellow folder application and go to the “downloads” section on the left side of your screen.
2. You will open “downloads” where you will see this application installed for Java.



3. If you see this it is important you click on it and allow it to make changes to your device.
4. You will then install the final installments on your device and you will be ready to use it.

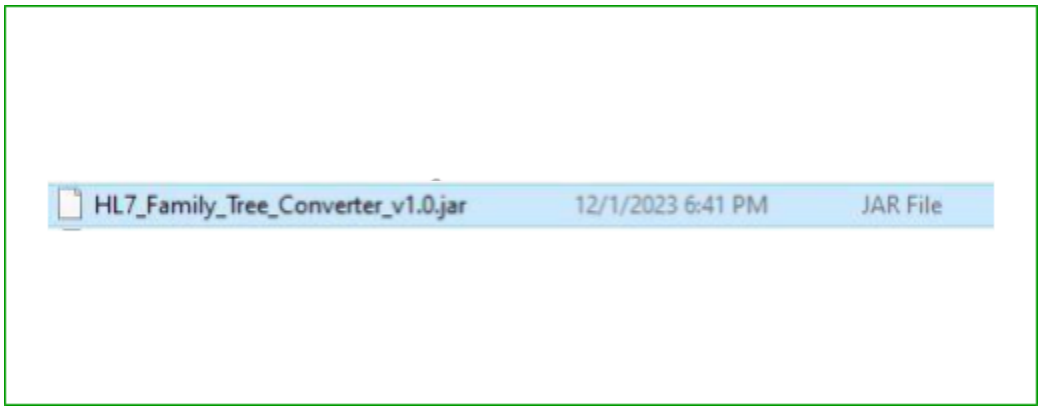
NOTE: If you get an "error" message, make sure you follow every step and check if your Java program matches the one given above. If you are still struggling contact the developers for further information.

2.4 Running The Program: Installing and Running The Program.

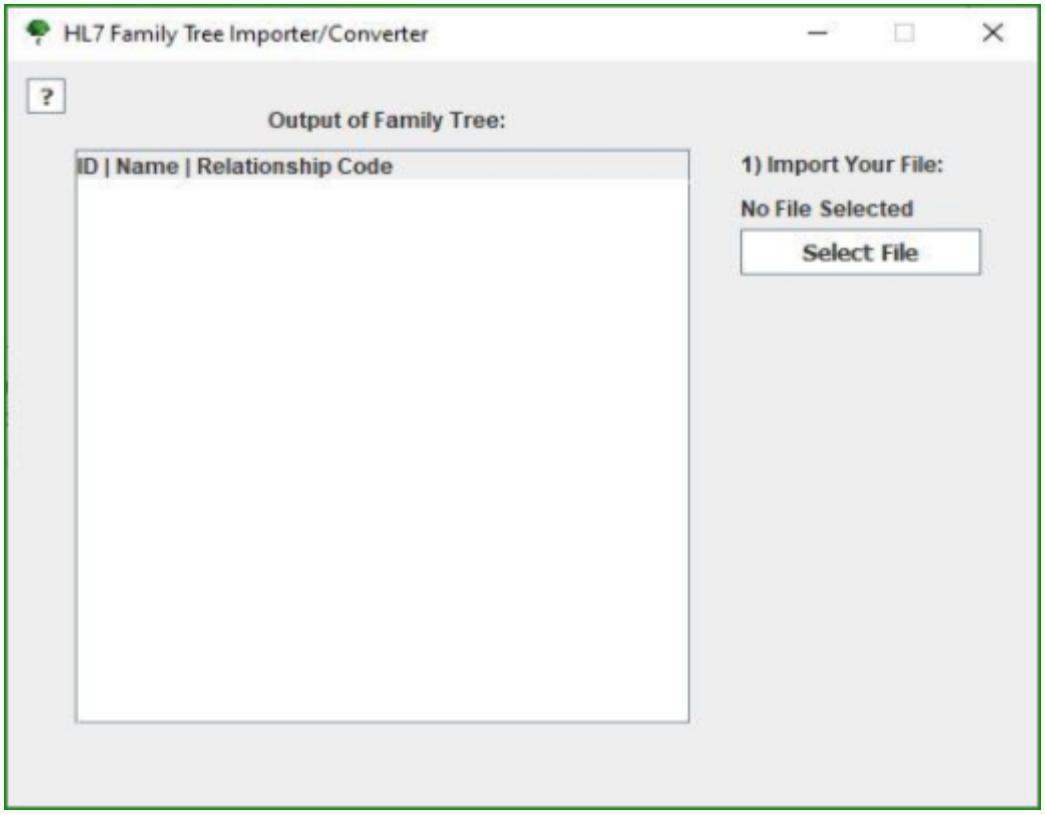
The program itself is quite simple to set up. At this point, the converter should have already been in your possession, if not, the download file should be ready. If all steps were followed before this step, getting the program up and running would be a fairly simple process. As mentioned before, you will need Java 21 64-bit ready.

2.4.1 The Program: Running The Program Correctly

1. You will want to go to your yellow downloads folder application at the bottom hot bar of your computer.
2. Click on the application and go to the "downloads" section of your application on the left side of your computer.
3. You will want to find the XML_HL7_Converter_v0.1 application in your downloads that looks like this below:



5. Double-click on the program and it will automatically open up the application. You should see this screen below:



If your application has successfully opened, you are ready to begin the process of using the program.

NOTE: If the application DOES NOT OPEN repeat steps 1 and 2. If those do not work contact the developers for further guidance and information.

3 How to begin working with the program

Now that you have the application installation steps complete, you can freely use the program to select patients and import XML/HL7 files. The files that are provided to you can be used to follow along in these steps. You can implement any of your files if you would like. This process/workflow is going to get you familiar with importing a file into the program to understand the following:

Requirements/ Conditions:

1. ***Import XML/HL7 Files:***
   - *User must have completed process/workflow one to complete this step.*
   - *Users must have the correctly formatted XML/HL7 files and the program fully functional on their screen.*
   - *Users will understand how to open a file using the program and how to import the file.*
2. ***Selecting a patient to become the primary patient (ID = 1):***

- *Users will learn how to use the "output" box in the program to read and select the correct family member they wish to make the primary patient*

3. ***Selecting another family to make them become the new primary patient:***
    - *Users will learn to select other patients as their focal point after they have selected a primary patient in the "output" box.*
4. ***Editing family members information that does not have a relationship code***
    - *Users will learn how to select family members with "No Relationship Codes" and edit and customize them to their liking*

This initial configuration process lays the foundation for subsequent workflows, ensuring that users can interact and use the program through the XML/HL7 family tree tool. The successful completion of this configuration is essential for an optimal user experience throughout the tool's use.

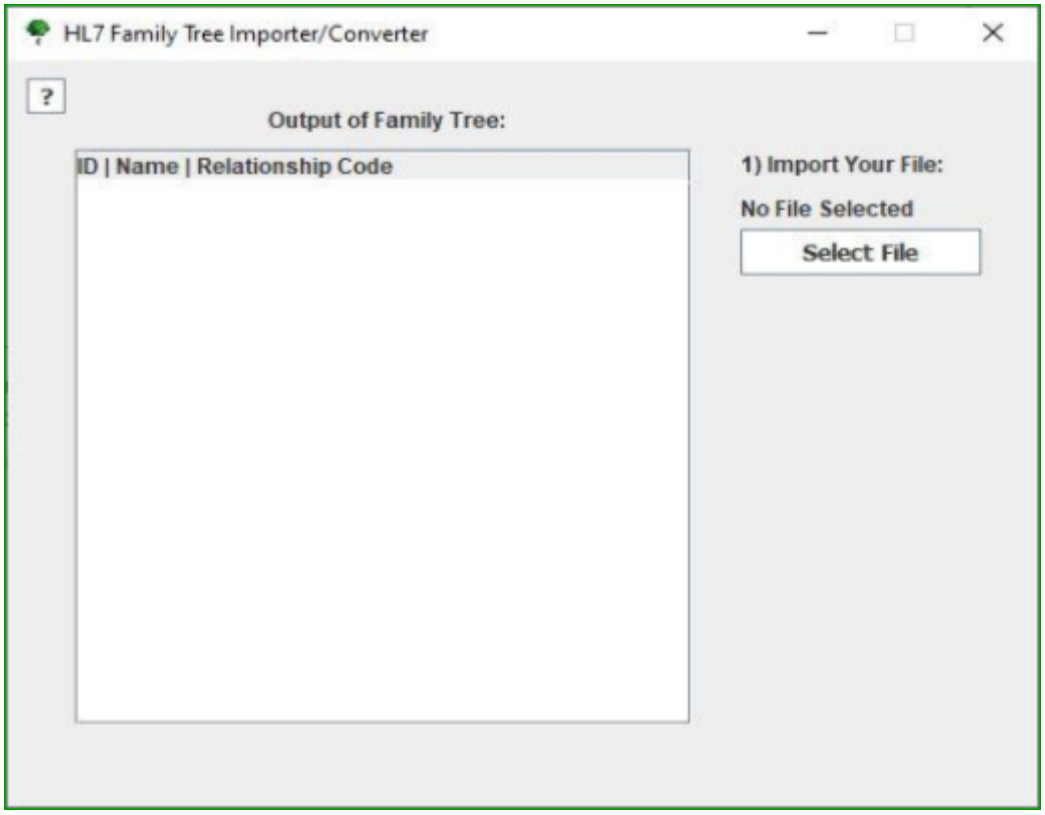
3.1 Import XML/HL7 Files: Learning to import the XML/HL7 files correctly

The program only reads XML/HL7 files that have a set amount of information inside of them. The fun part about this program is that it makes it simple for users to find their XML/HL7 files all in one spot.

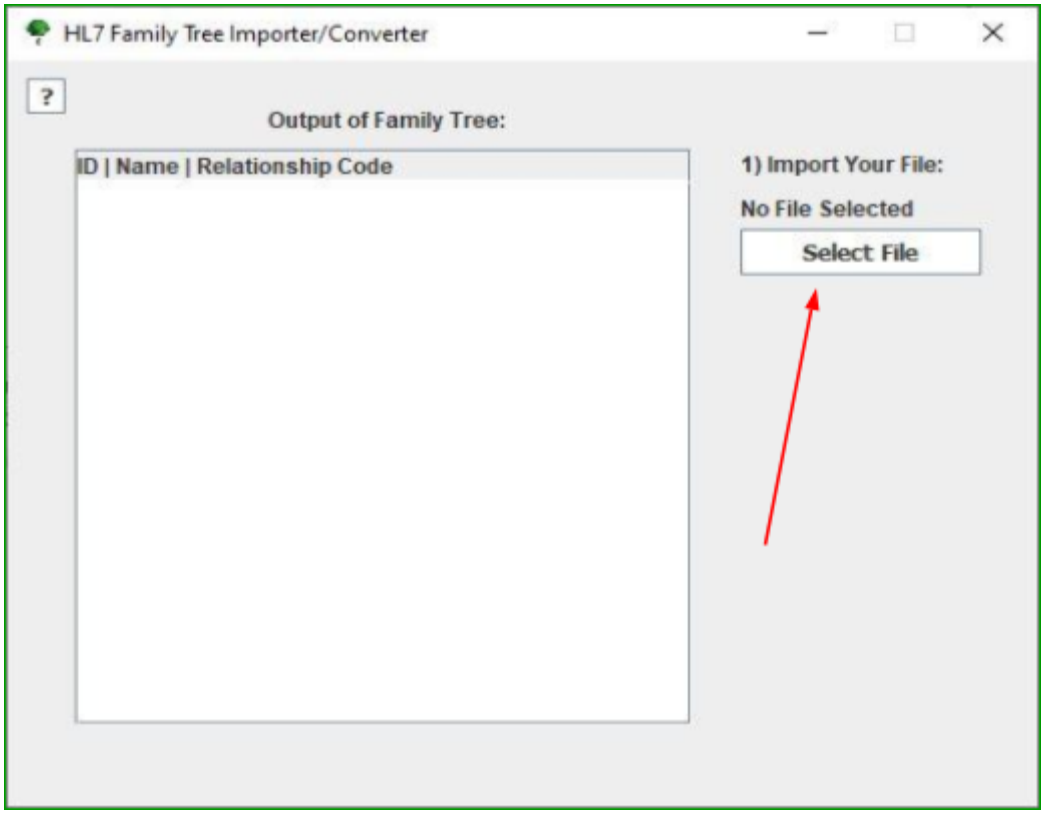
The program ignores all other files that are in your device and only lists out the XML/HL7 files in your computer. All you will need is the program open and your files on your device to fulfill this task.

3.1.1 XML/HL7 Files: Import your files

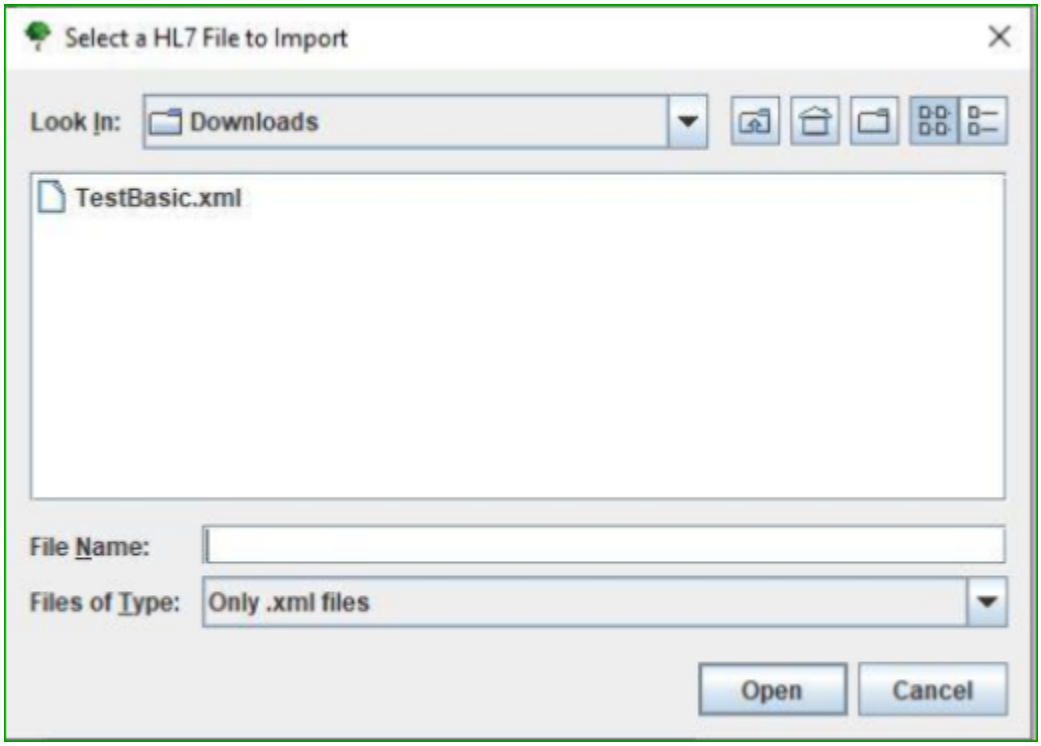
1. You will want to have your program open as seen in step 5 in procedure 2.3.1.



2. You will want to move your mouse over to the right side and click on the “Select File” button.

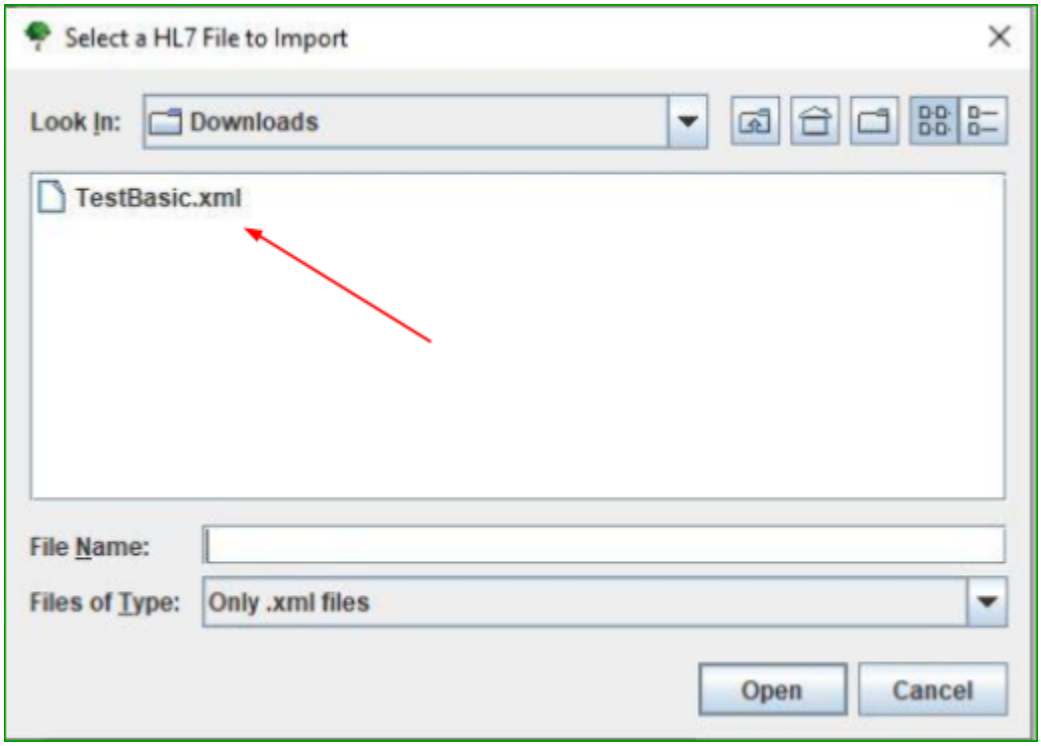


3. Once you have clicked on this button, you will be directed to your device's internal storage.

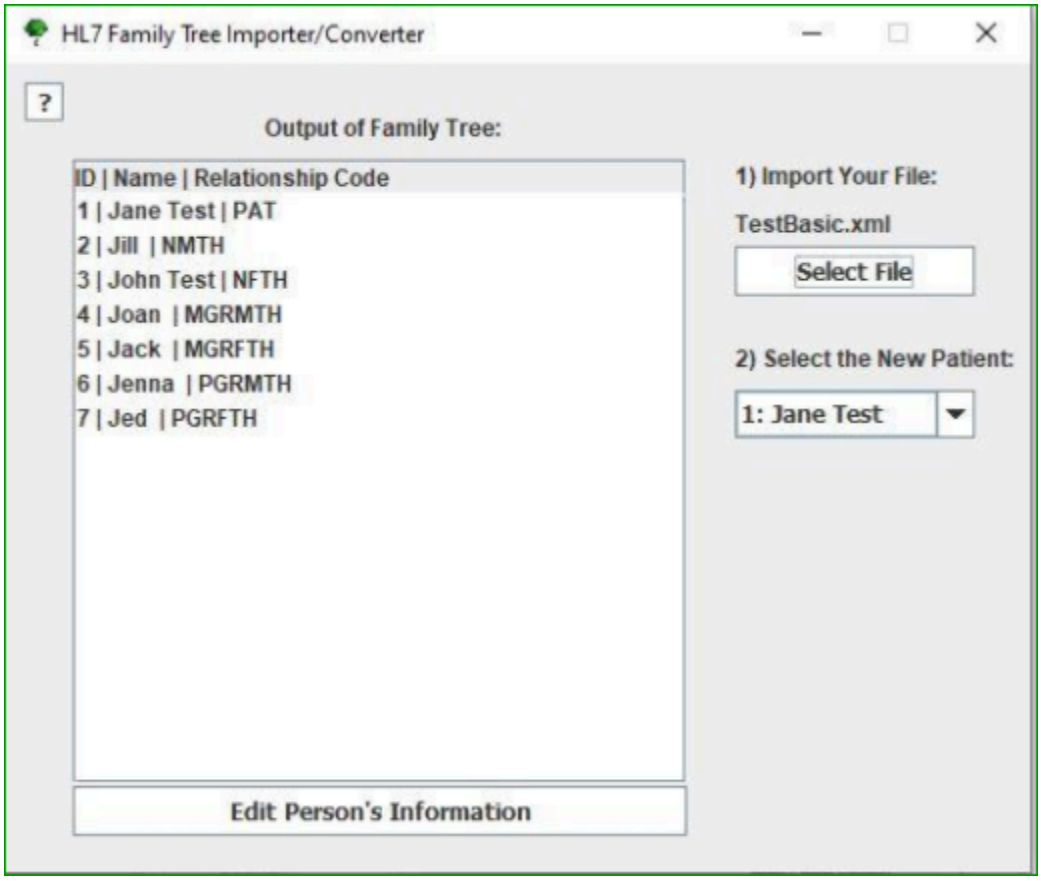


4. Your XML/HL7 files should already pop up in the new window. You will want to click on that file and it will open up in the program. The picture above is a basic example of what you may see and what the file name should look like.

NOTE: If your XML/HL7 file does not open, simply click the small black down arrow on the right of the "Look in" bar and scroll through your internal storage to locate the file needed. Only XML/HL7 files will pop up so it should not be too hard to find.



5. Once you click on the file, you will be redirected back to the home screen where you will see a list of names in the output box in the middle of the program screen as seen below.



If the list opens up. You see the seven names in the output box, and then you have successfully opened the list of names you want to research that is in the XML/HL7 file.

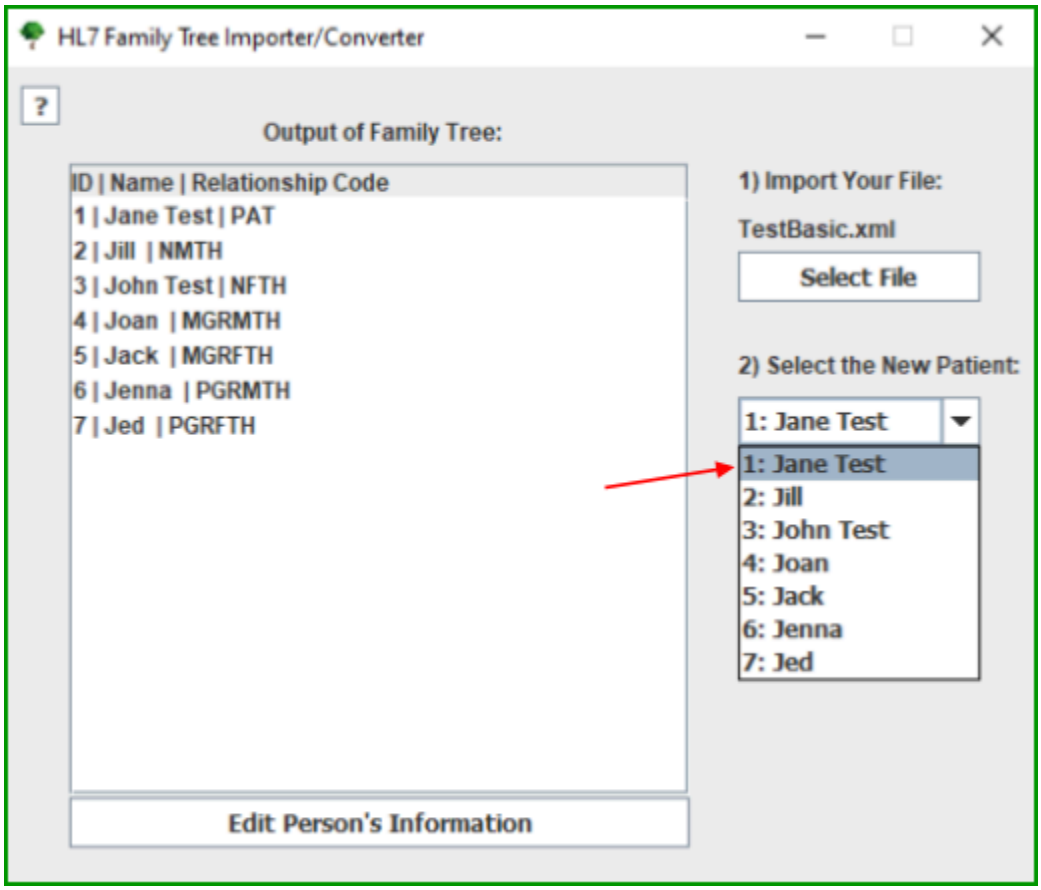
NOTE: If you select "open" and the file gives you an "error" message, double-check to make sure that you either (a)have the correct file or (b) have the correct formatted file. If that does not solve the solution, contact one of our developers.

3.2 Selecting First Patient: Understanding how to read the list in the output

As you noticed in the prior process/workflow, the program will list names based on the number of family members in the XML/HL7 file. They will be listed as 1-the total amount of family members to choose from (In this case that is 1-7). In this section, we will look over how the list reads in its default stage.

3.2.1 Patient ID = 1: Understanding how to read and navigate the list

1. The list in the example has names listed 1-7. The patient that is labeled as number 1 is your main patient who will have all the information in the exported file. If you are selecting Jane, the information is already implemented for you.



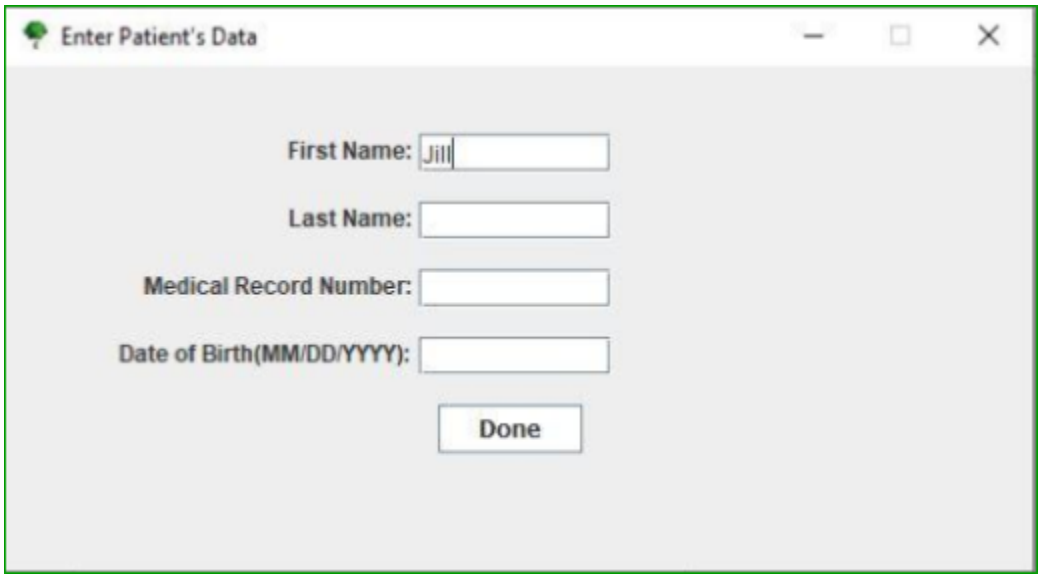
listed below is a more simplified version of the values you can see in the output list and their meanings:

Indicator	Definition
Value 1: Jane Test	In this case, Jane Test's code is PAT which is considered the main patient.
Value 2: Jill	Jill's code is NMTH meaning that she is considered the natural mother of Jane in this list.
Value 3: John	In this case, John's code is NFTH meaning that he is the natural father of Jane.
Value 4: Joan	In this case, Joan's code is MGRMTH meaning that she is considered the maternal grandmother.

Value 5: Jack	In this case, Jack's code is MGRFTH meaning that he is the maternal grandfather
Value 6: Jenna	In this case, Jenna's code is PGRMTH meaning that she is considered the paternal grandmother.
Value 7: Jed	In this case, Jed's code is PGRFTH meaning that he is the paternal grandfather.

Figure 3-1: Values of the family tree

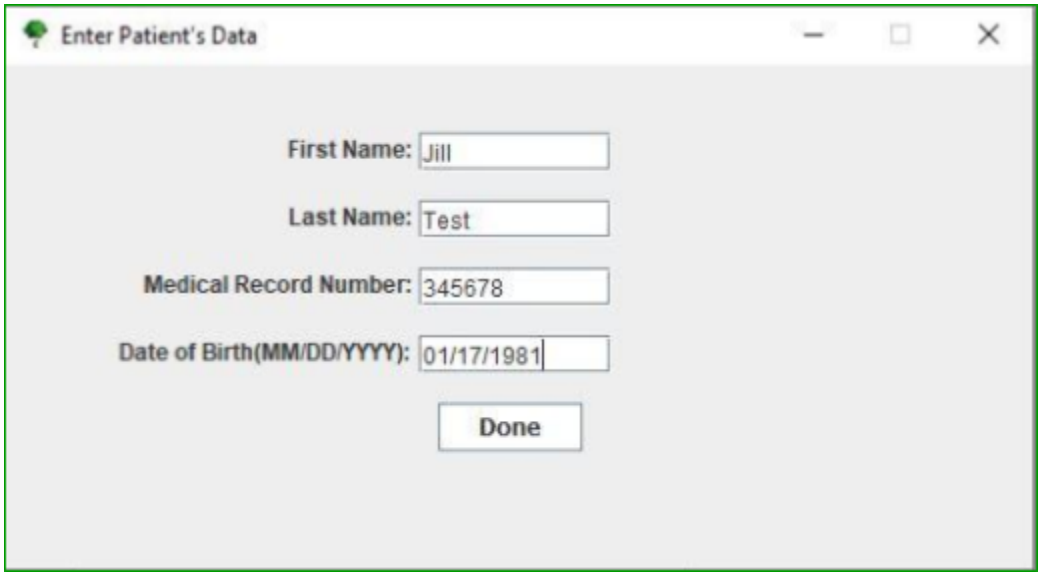
2. If you wish to click on another patient you will then click on the name and a window to put information about the patient inside of that window will pop up. Once you have finished implementing all the information, click "Done".



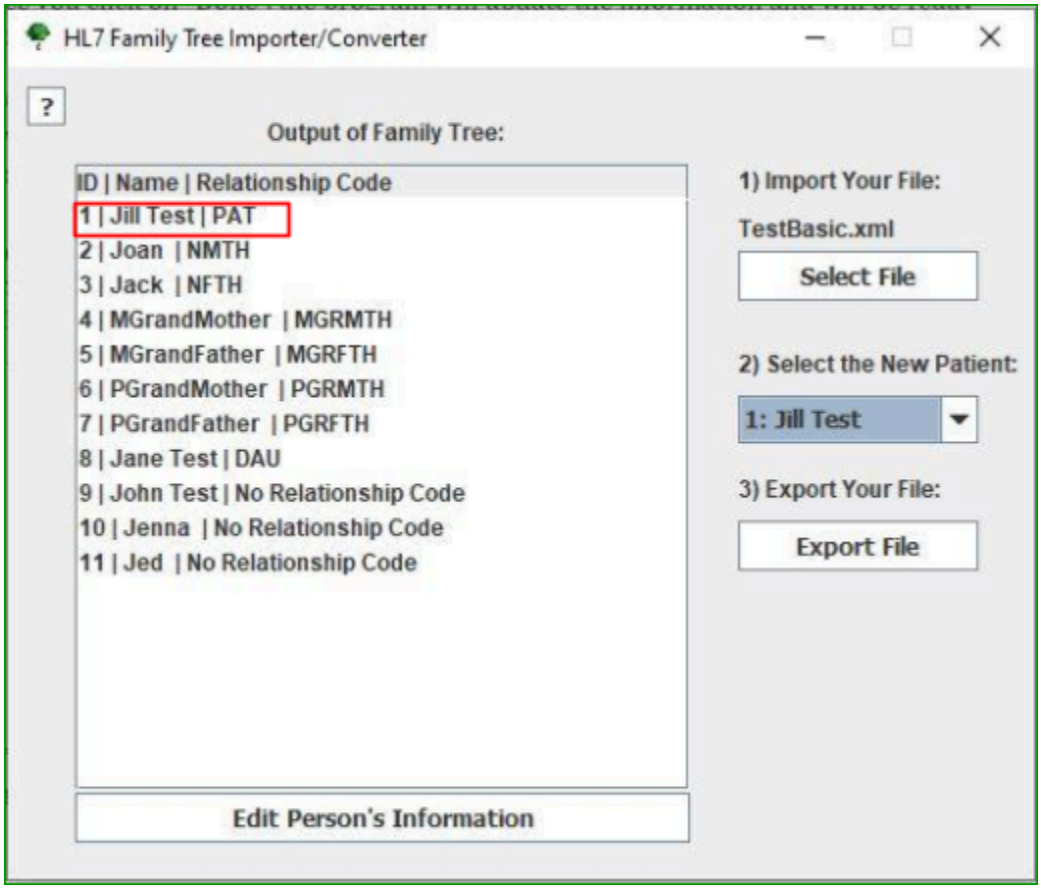
3. Once you click on "Done", the program will update the information and will be ready to be exported. We will go into a more in-depth process in the next step of this part.

3.2.2 New main patient: Re-orienting a new patient

1. Now that you know the basic process, this next part will be simple. Repeat the process of section 3.2.1. Instead, scroll through the list and select a new family member to become a patient or a new main patient (ID = 1).
2. Once you select the new patient, you will implement the correct patient information and click "Done". The program will then reorient the list to set your selected patient to ID = 1. The program will then save the information and you are ready to export your new file.



3. Once you have clicked "Done," you will be redirected back to the main menu where you will see the list in the output box that has changed your selected family member to patient 1.



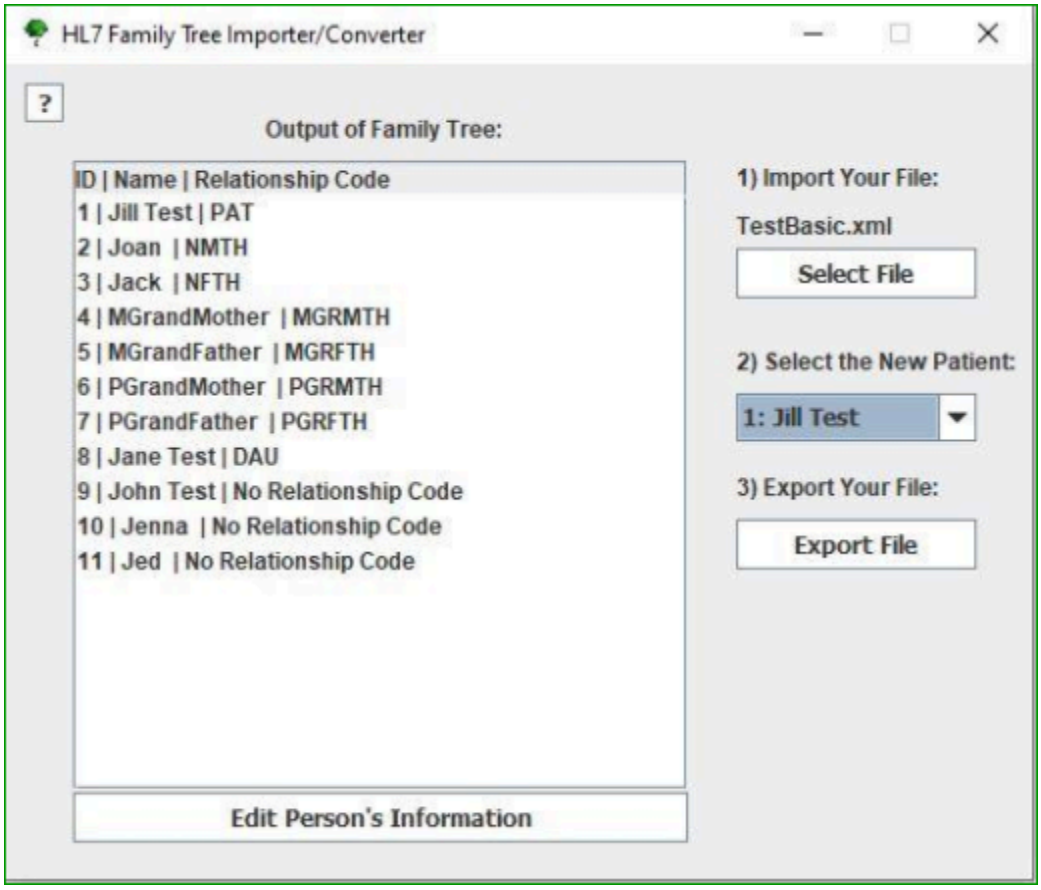
Now that you know how the list works and how to reorient it, you are ready to move on to exporting your file and creating new files based on the information you gave the program.

3.3 Changing Selected Person's Information

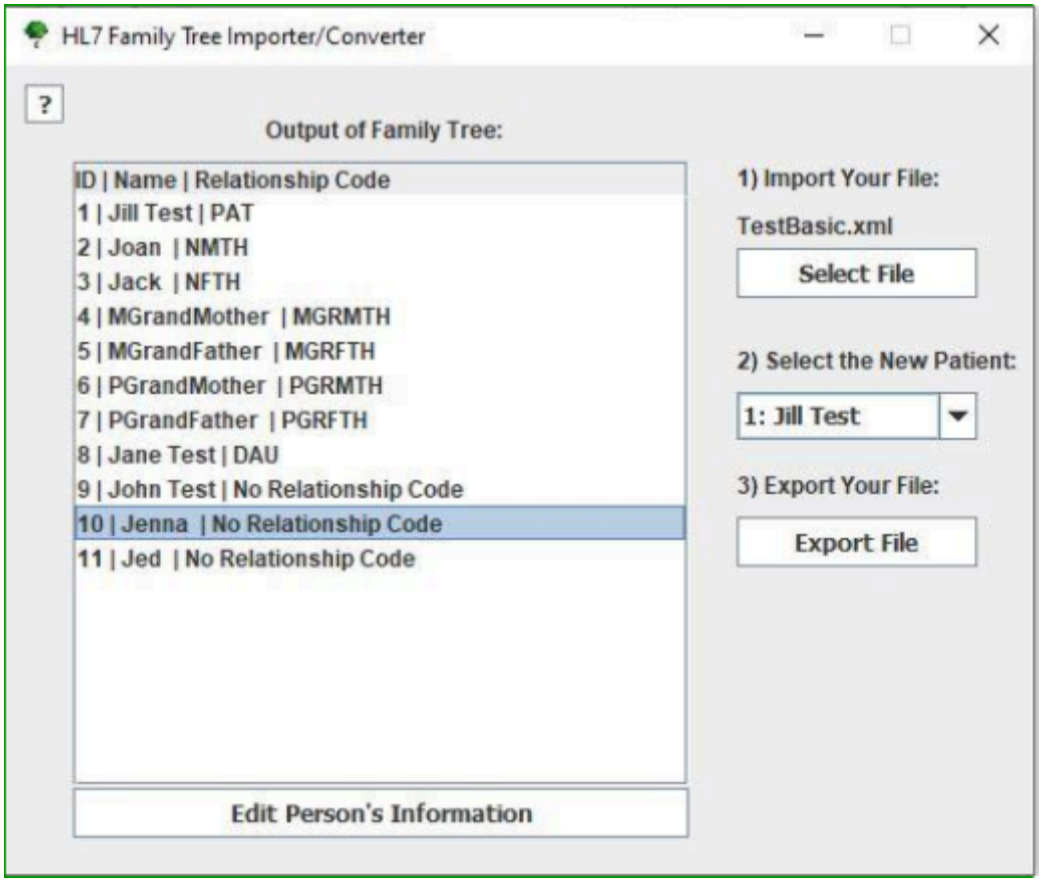
Some family members may not have relationship codes. This is because there is a chance that the program will pull out family members that are not related to the patient, but married their way into the family. This can be aunts or uncles who may have married a brother or a sister in the family. In this section, you will learn to add this information for the program to export into a new file.

3.3.1 XML/HL7 Files: Import your files

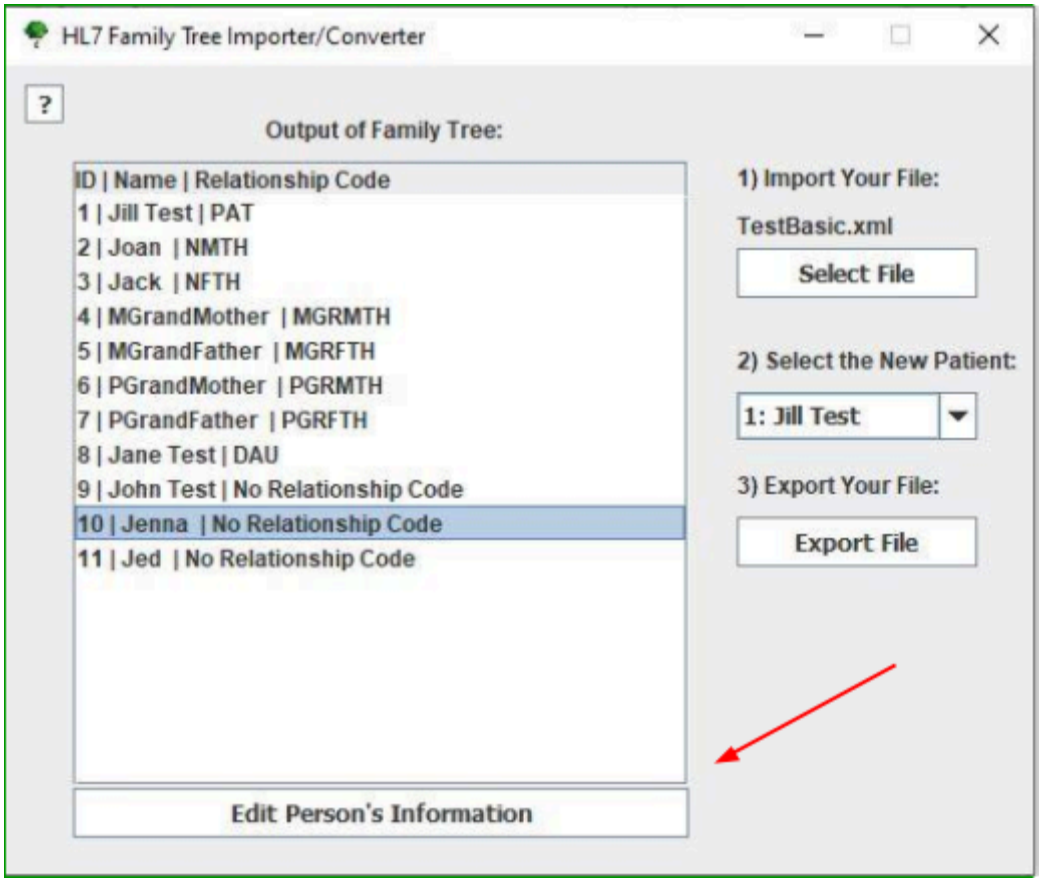
1. The implementation/ reorientation of the family tree does not affect what family members you can choose and not choose in the output box. To edit a person's information, simply have a file loaded into the program. For this step, we will continue to use "TestBasic.xml" after the family tree is reoriented. as seen below.



2. You will want to simply hover your mouse over the family member that you want to change the information on and click it. The name will be highlighted in blue.

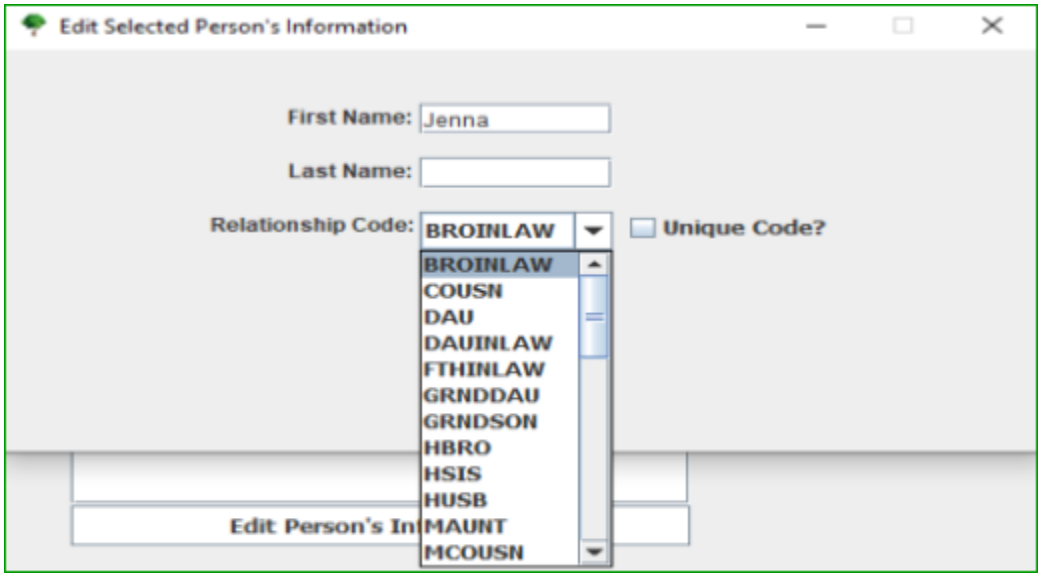


3. Once you click the name and it is highlighted blue, you will then want to click the button below the output menu labeled “Edit Person’s Information”

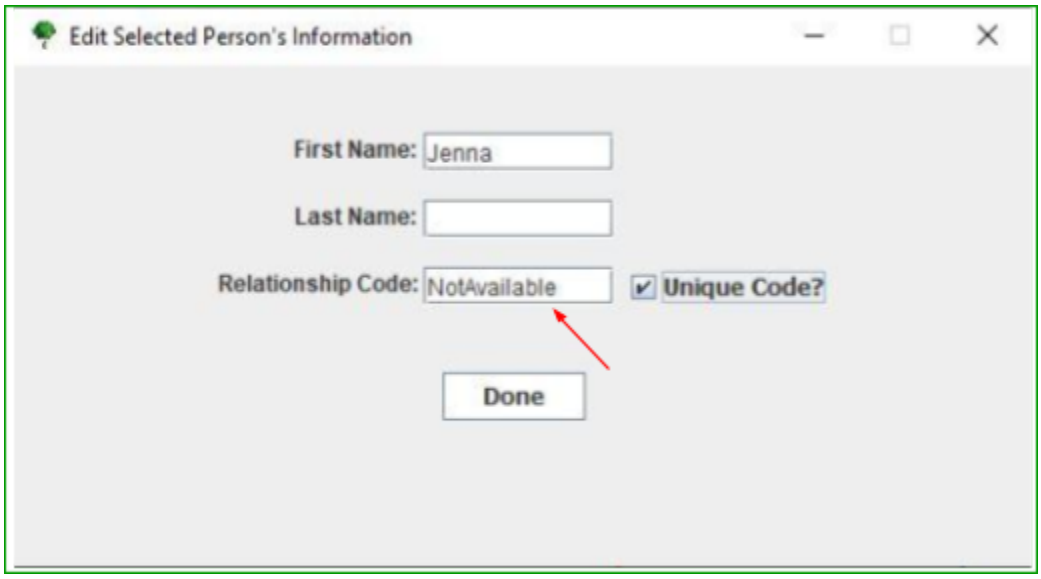


4. A new window will open that introduces a way for you to change the patient's code to an already existing code, or a custom-made one. You can also change the last name of the person or add a last name of your choice.

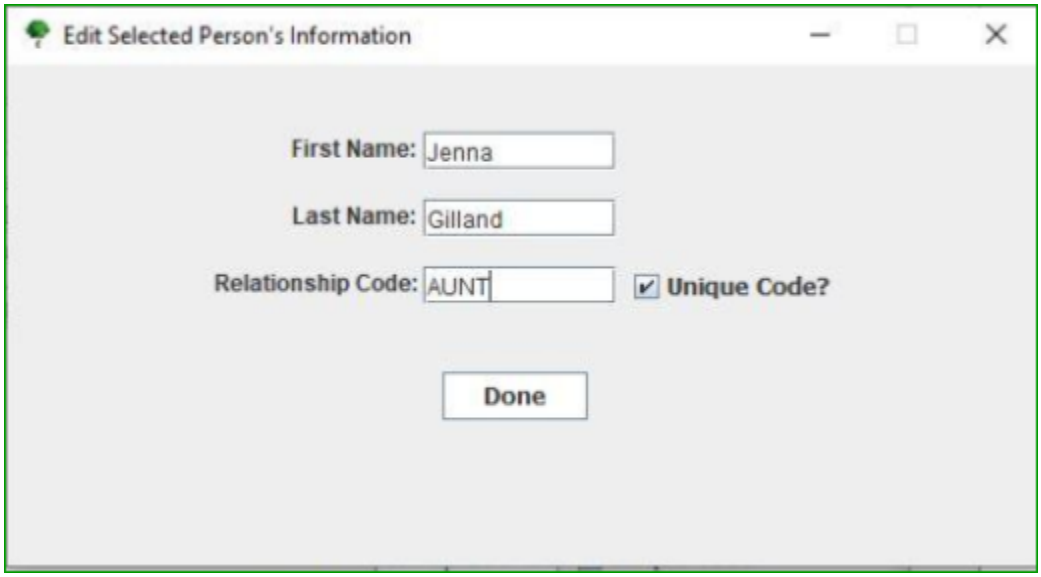
The screenshot below shows the drop-down menu for all the relationship codes already existing.



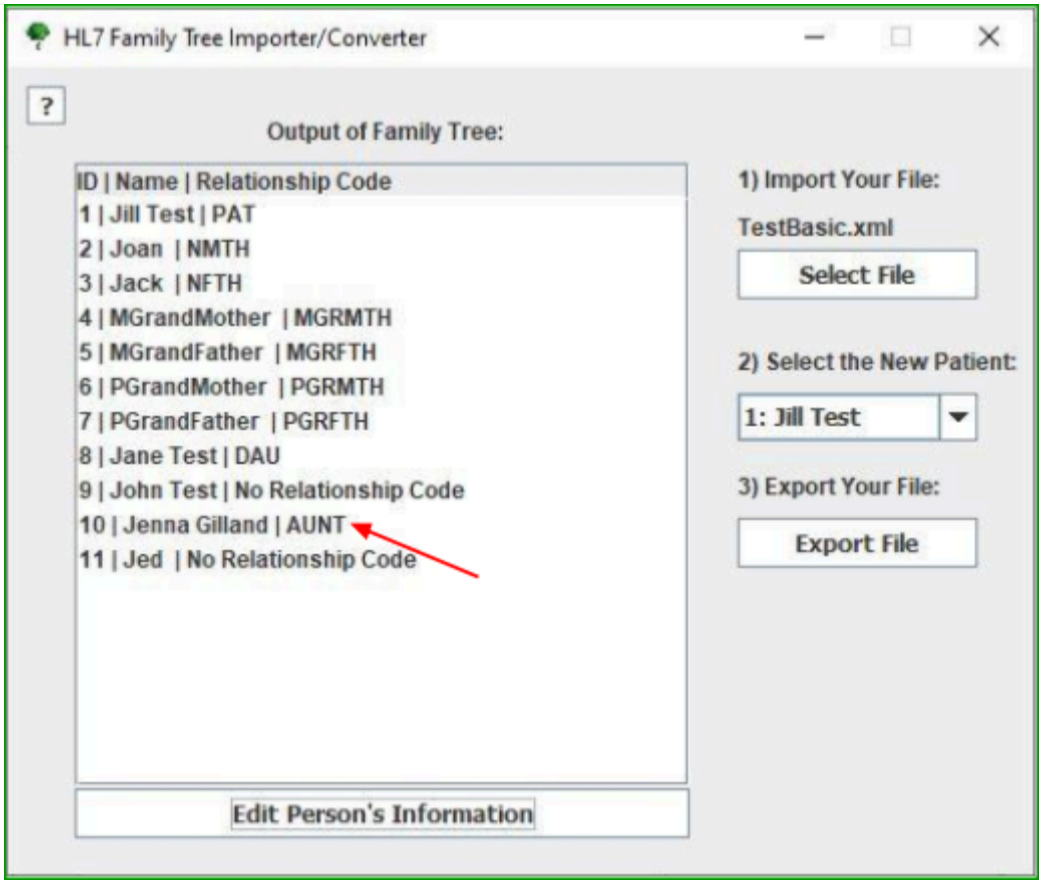
5. You can either select one of those codes, or you can implement your own using the "Unique Code?" option to the right of the drop-down bar. In this example, we are going to use a unique code.
6. Simply click on the small check box on the right that is labeled "Unique Code?" The text will then unbold itself and say "NotAvailable". This will tell you that you can now start typing in the word box.



7. You will then type in the last name and your relationship code in the box. This relationship code can be anything of your choosing. It DOES have to be in a similar fashion to the codes in the drop-down list but can be any word you want. In this example, we are going to use the word "AUNT" in the text box.



8. After you have implemented all of that information in the system, click on "Done" and you will see the changes in your output box.



4 Exporting your new file

The exportation of the new XML/HL7 files is an important aspect of the program. this part of the program will take the basic information you implemented into the "Enter Patient Data" window and create a new functioning XML/HL7 file that automatically codes the information into the file that the user provided. These new XML/HL7 files can be used to read new information once implemented into the sandbox. It can also be implemented back into the program and used just like all other correctly formatted XML/HL7 files. The process/workflow covers the following:

Requirements/ Conditions:

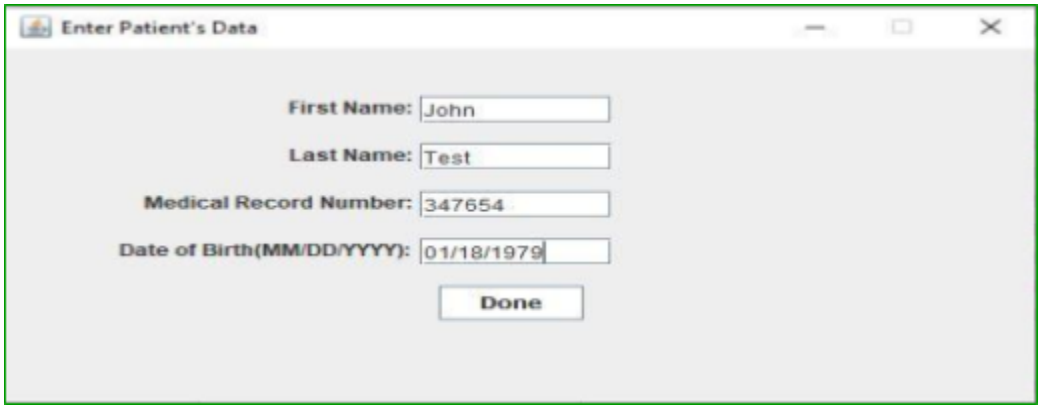
1. ***Exporting the file to create a new one:***
   - *Users will learn how to export the file and where to find the new file once it has been exported.*
2. ***How to read the new XML/HL7 coding file created by the program***
   - *Users will be able to spot the new information they implemented into the program.*

4.1 Exporting the file to create a new XML/HL7 file

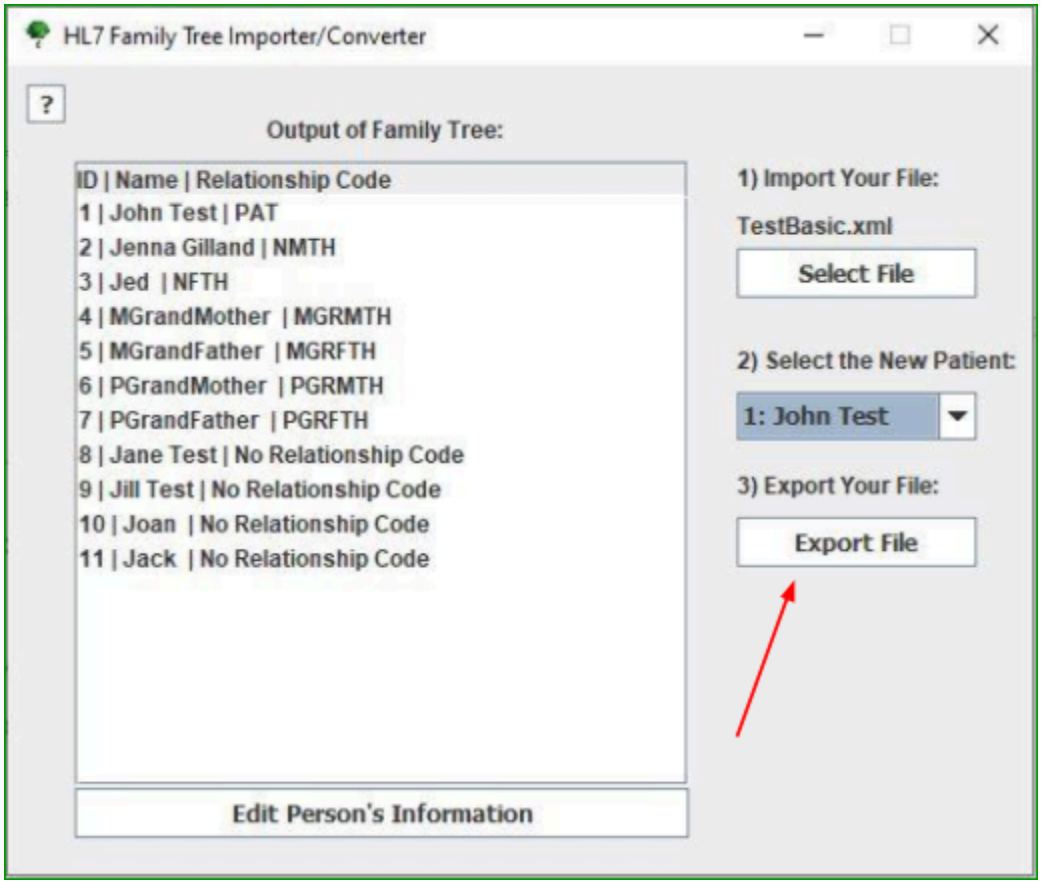
Now that you know how to change the main patient and set a new patient to ID = 1, it is time to take all that you know and export the file you wish to create and make a new XML/HL7 for the sandbox to read.

4.1.1 Exporting a new file

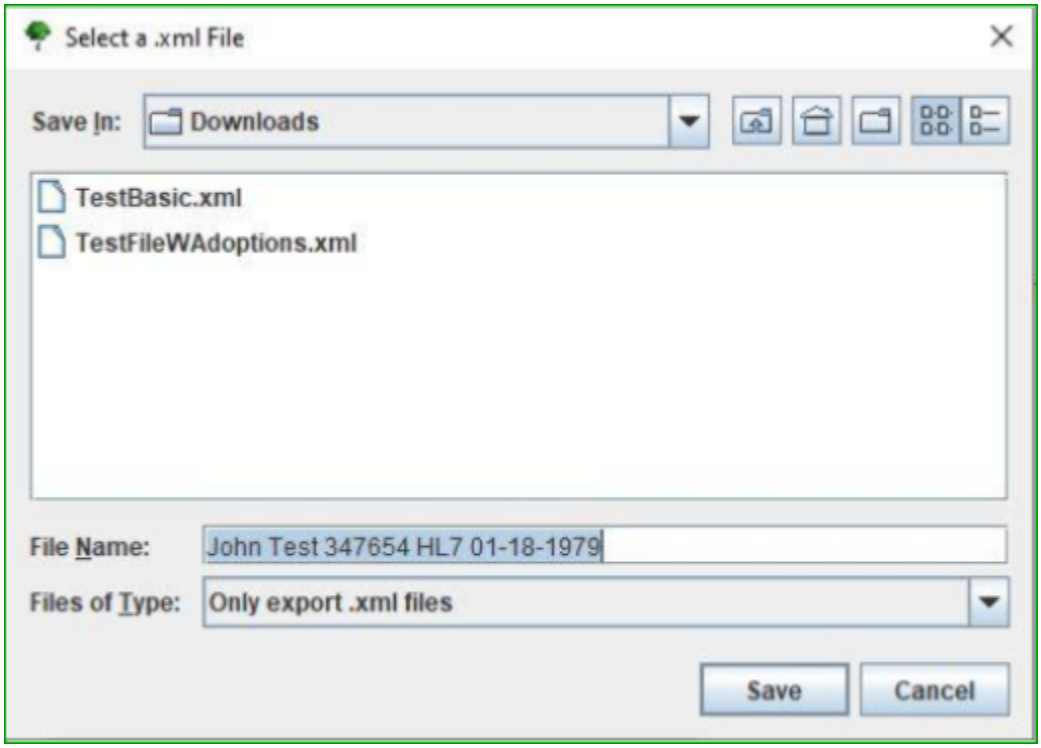
1. First, you will want to implement the basic information such as first name, last name, patient record number, and date of birth into the data window as seen below.



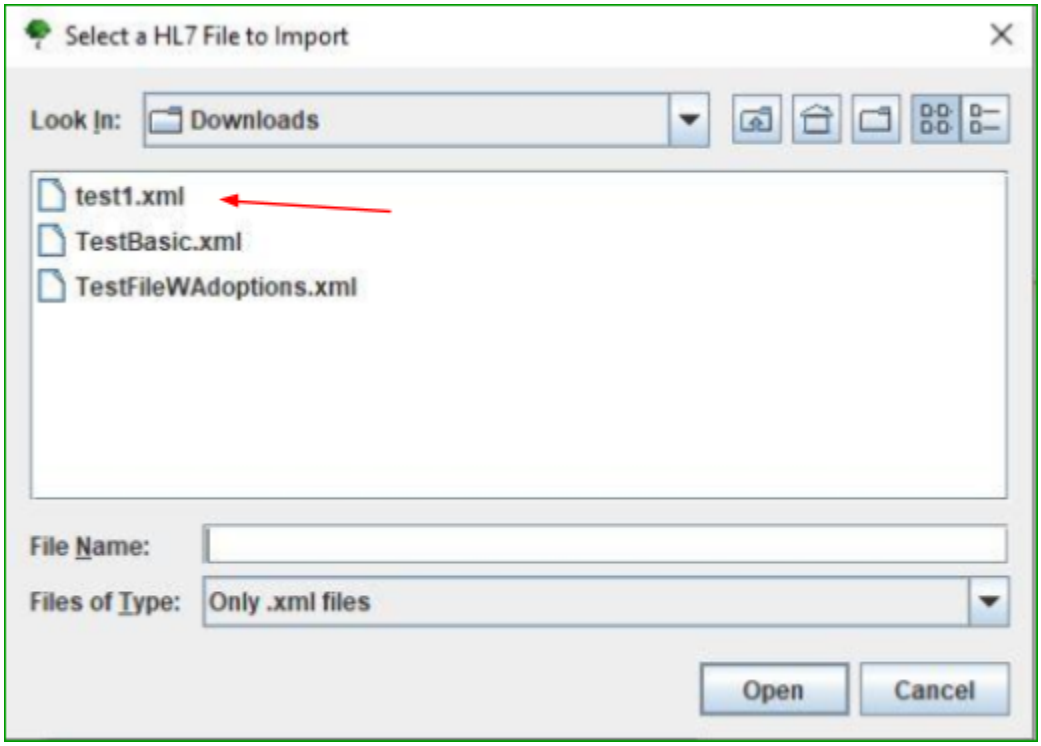
2. You will then select “Done” where you will go back to the home screen. You will then select “Export File”.



3. Once you select 'Export File" you will be met with this screen.



4. You can name the file anything you would like and save it to your desired folder.
5. You will then select “save” and be met with a pop-up that says “Export Saved Successfully!”
6. You can see in the photo below, that the file will save as an XML/HL7 file. The file with the red arrow pointing to it will be the new file.



4.2 Reading your new exported XML/HL7 file:

Now that the file has been exported, it is important to see how the program reoriented the file information based on your choice of patient and information you implemented into the data log window. In this section, you will get to understand how to read the code where to locate that information, and the change in the new exported coding.

4.2.1 Reading the file

1. Once the new file is created, you will want to go into your device's internal storage and locate the new file in your downloads folder. It will look similar to this:

2. You will then want to double-click on it and the file code will open up. and present all of the information inside of the code.

3. You can now see that John is at the top of the XML/HL7 code. In the picture above, all the implemented information is updated. This can be seen with the red arrows. The date of birth was updated and the patient ID was changed along with “John” becoming the main patient.

NOTE: If you decide to put this file back through the program, there is a chance it could duplicate names. If you wish to reset the family tree, you can either simply select a new patient or close out the program and open it again to refresh it from the beginning.

5 Appendices: Handling issues/ understanding the program

Welcome to the Appendices section of the XML/HL7 Family Health Navigator User Manual. This additional section is designed to enhance your understanding and provide additional support as you navigate through the tool's functionalities. The appendices offer valuable resources, samples, and references that complement the core content of the manual.

What you will find in the Appendices:

1. ***XML Encoding Standards:*** *Delve into the W3C standards website that you may use to answer any questions regarding standards this program might uphold.*
2. ***Troubleshooting Guide:*** *When challenges arise, turn to this troubleshooting guide for solutions to issues. It provides insights and recommended help actions to help you overcome obstacles efficiently.*
3. ***Contact Information and Support Resources:*** *In case of further assistance, find contact information and links to support resources. This ensures that you can reach out for prompt and effective support.*
4. ***Glossary of Terms:*** *Refer to this comprehensive glossary for clear definitions of key terms used throughout the user manual. It aims to demystify technical terminology ensuring a smoother learning experience.*
5. ***Interface Elements Reference Guide:*** *Familiarize yourself with the various elements of the graphical user interface of the program using this reference guide. It provides a visual aid to help you identify and understand interface components.*

5.1 XML Coding Standard Support:

**DISCLAIMER* This program does not run on any elements of the web-based connections, or connect to the internet. The program also does not store any medical or clinical data from any patient. It only generates the information given to it.*

If you have any questions regarding the information given above or you would like to look further into the standards yourself check through the W3C website. The link is provided below.

Link: https://www.w3.org/

Here, you can search for any standard you feel the project might meet or need to uphold. If you have any more questions or concerns, you can contact our team project manager, lead developer, or technical communicator below.

Email contact list:

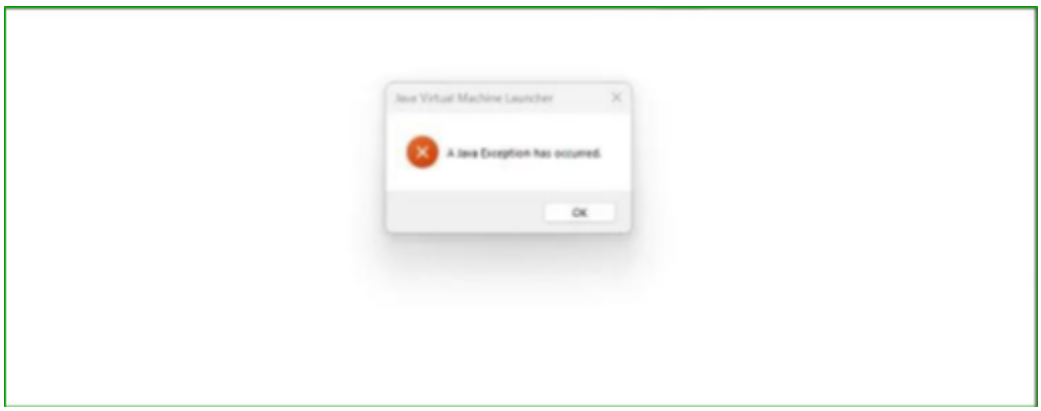
- **Team Manager:** echack@csustudent.net
- **Lead Developer:** amthompson@csustudent.net
- **Technical Communicator:** CAGillispie@csustudent.net

5.2 Troubleshooting Guide:

Not every program can be perfect, and you are bound to run into some issues regarding the functionality of the program whether that is with the files or the navigator tool itself. If you were to run into any issues, before contacting one of our team members, please take the time to troubleshoot any of these problems if you come across them.

5.2.1 If you get a "Java Exception" error message while trying to start up the program

1. If you are trying to start up the program, there could be a chance that you could get this error message below:



2. This is because the program may not have the latest version or the correct version of Java installed on your device. You will need to get the latest version using this link below:
    - Link: https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.exe
3. You will then be redirected to the screen that is shown in 2.2.1 and the correct version of Java should begin to install.

5.2.2 The program does not open the XML/HL7 file

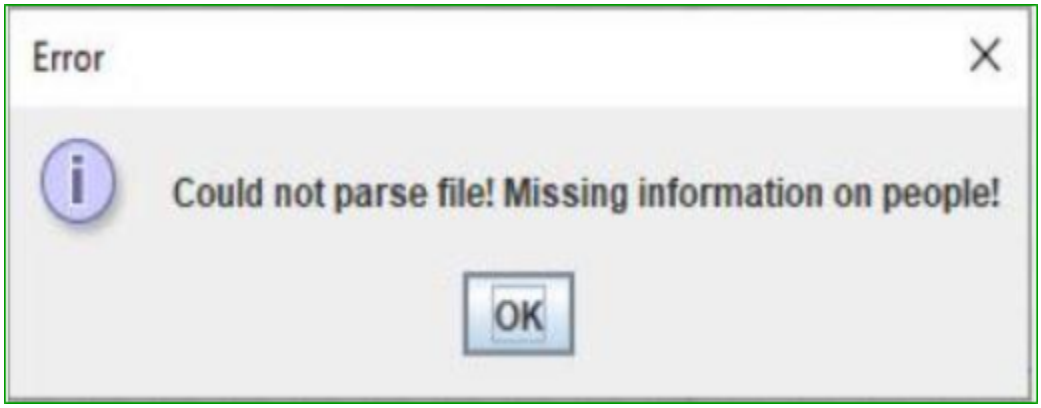
1. You will want to make sure to first check if you implemented the correct information into the system. Simply open your external storage folder, go to your "downloads" folder, and implement it into the system again.
2. If that does not work, you will want to open the file coding to be sure that the formatting fits the right kind of requirements. Below are two photos that show what a correctly formatted XML file looks like

Correctly Formatted

If your file's coding might look different, there is a chance that the formatting could be incorrect. You may want to contact a team member for further information. All contacts can be viewed in the “Contact Information” appendix section.

5.2.3 The file does not parse

1. There could be a chance that your file may not have the correct information. Most likely, you could have a file missing basic information on the patients the program needs to parse the file into a list. Below is an example of what you might receive if you try to implement a file with missing information into its output:



2. Make sure that the coding has all the information on the patients as needed. If only half of the file is programmed, it is most likely you have a faulty file and the program does not know how to read it.
3. You will want to contact a team member found in the contacts list further below in the appendices.

5.3 Contact Information and Support:

The contact information and support gives a brief list of every email for all team members who helped work on this program. If you have any further questions, this appendix is used to help get in contact with any member you feel might be able to help you further.

5.3.1 Email contact list

1. Team Manager/Tester: echack@csustudent.net
2. Lead Developer/Trainer: amthompson1@csustudent.net
3. Developer: jrstradford@csustudent.net
4. Developer:
5. Technical Communicator: CAGillispie@csustudent.net

5.4 Glossary of Terms:

The appendix is a simple section of the user document that helps to clear any keywords used throughout the user manual. It helps to simplify the technical terminology to ensure a smooth learning experience.

C.

Configure

To set up or adjust the settings, options, or parameters of a system software, or device to make it suitable for a specific purpose or user preference.

F.

Family Tree List

A visual representation of the family relationships that are encoded into the XML/HL7 files. The family tree list is generated by the tool to provide users with a better understanding of the patient connections.

H.

HL7 (Health Level Seven)

A set of standards for the exchange, integration, sharing, and retrieval of electronic health information. It is often that HL7 is seen or used in healthcare IT to facilitate communication between different systems.

I.

ID (Identifier)

A unique numerical or alphanumeric code assigned to each individual in the patient data. In the XML/HL7 GenealogyHealth Explorer Program, the focus patient is always assigned an ID of 1

Interface Element

The components of the user interface that users interact with include buttons, menus, and other graphical elements that facilitate navigation and data organization.

P.

Parse

This happens in the analysis state of compilation. In this part of the program, the code is taken from the preprocessor, broken into smaller pieces, and analyzed so other software can understand it.

U.

User Interface

The visual interface through which users interact with the XML/HL7 GenealogyHealth Explorer Program. This includes elements such as buttons, menus, and other visual representations in the program.

X.

XML/HL7 File

A file that contains data encoded in XML/HL7 format. These are then imported into the program and provide clear and concise definitions for each other.

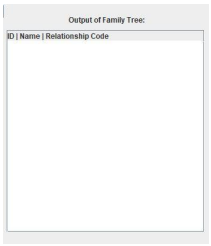
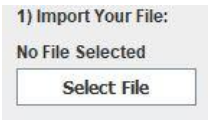
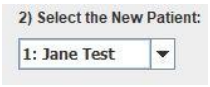
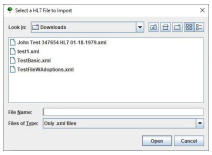
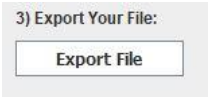
XML

A markup language that defines rules for encoding documents in a format that is human-readable and machine-readable. This program is used to structure and represent patient data.

5.5 Interface Elements Reference Guide:

The interface of the program is a straightforward process. However, it is important to get a confirmed understanding of how each of the elements of the program function and what their significance is to the program itself.

UI Element	Definition

	The output box, remains blank until a file action is conducted. The output box generates the family tree list in a single file order starting at 1 (the main patient) and lists all family and their information in the file given.
	The import/select file button is the button the user will click on that will allow them to open up their device's internal storage. There they will find the XML/HL7 file they wish to implement into the program. The program will then read the file and generate it in the "output" box.
	The "Select New Patient" is a drop-down list tool that allows the user to select a new patient for them to reorient the family tree and get new information on that family member they wish to know more about.
	The "Select a HL7 file" window is an element that is used to look into the internal storage of your computer to find the XML/HL7 file you wish to parse into the program. It ignores all other files on your device and only lists your XML/Hl7 file.
	The "Export" button is the final result. The user will click on the button that will confirm the program to create a newly exported XML/HL7 file that has all the new and updated information within it based on the user's implementation of the information given.
	The "Edit Person's Information" button is a button the user can click on that will take them to a window where they can customize/edit a person's last name, and family relationship code. The code and the name can be anything they want and DOES have to follow the codes already implemented in the output list.
	The "?" icon simply gives the user the version type of the program they are using at the current moment along with the developers and managers of the project.

Empowering Healthcare Connectivity