

CDA Validation Plus User Guide

Version 4.0

(Based on CDA Validation Plus 4.0.0, Released May 2018)

**Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control
National Program of Cancer Registries
Registry Plus™ Software for Cancer Registries**



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Chapter 1: Introduction

Overall Learning Objectives

These are the overall learning objectives for this CDA Validation Plus User Guide:

- Learn about the various features of the CDA Validation Plus program
- Learn how to launch and exit CDA Validation Plus
- Learn about the CDA Validation Plus File, Utilities, and Help menu items
- Learn how to validate a single CDA document, multiple CDA documents, or run the application in batch mode to validate all CDA documents in a user-specified folder
- Learn how to run the application from the DOS command line
- Become familiar with the validation and reporting features of CDA Validation Plus, including the validation rules applied to the CDA document, as well as the types of validation errors that may be generated
- Learn about the various application sub-folders, their default locations, and content, as well as setting a custom database location in the application configuration file
- Learn about the CDA Validation Plus Access database structure and content
- Learn how to keep the software up-to-date with the most recently released version of the application.

Overview of the CDA Validation Plus User Guide

The CDA Validation Plus User Guide provides you with the information to understand and use the features of CDA Validation Plus, and describes the functions available to the end user. The major sections include downloading and installing the program, launching CDA Validation Plus, learning about and becoming familiar with the various menu items, CDA document validation processes, and reporting features of the program. You will also learn about the CDA Validation Plus Access database structure and content.

CDA Validation Plus Background

The Clinical Document Architecture (CDA) is a markup standard developed by the organization Health Level 7 International (HL7) to define the structure of clinical documents such as discharge summaries and progress notes. CDA is based on XML, the Extensible Markup Language. CDA uses HL7's Reference Information Model, the goal of which is to put data in a clinical or administrative context, to define how pieces of data are associated, and to take advantage of coding systems such as Systematized Nomenclature of Medicine -- Clinical Terms (SNOMED CT) and Logical Observation Identifiers Names and Codes (LOINC). CDA enables the creation of patient records that can be read by any electronic medical record (EMR) or electronic health record (EHR) software system. CDA is a flexible standard and is unique in that it can be read by the human eye or computer processed.

The Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries (NPCR) Registry Plus suite of software includes an application called Electronic Mapping, Reporting, and Coding (eMaRC) Plus. eMaRC Plus has been in use in the cancer registration community for years to process pathology reports received in the HL7 Version

2.x file format, identifying reportable cancer records and mapping from the HL7 message format and codes to the North American Association of Central Cancer Registries (NAACCR) Volume II Data Dictionary record layout and codes.

Functionality has been added to eMaRC Plus to process physician reports generated by EMR and EHR vendors and received by the cancer registry in CDA document format and map from the CDA data elements and codes to the NAACCR record layout and codes. eMaRC Plus assumes that the CDA documents presented to it have already been validated for content and structure. In addition, EMR and EHR vendors are in need of a tool with which to validate the CDA documents output from their software. As a result, CDC has developed CDA Validation Plus for these purposes.

CDA Validation Plus Features

CDA Validation Plus is a part of the Registry Plus software suite of publicly available free software programs for collecting and processing cancer registry data developed at CDC's Division of Cancer Prevention and Control in support of CDC's NPCR. CDA Validation Plus is a tool used to validate the structure, content, codes, and coding systems of CDA documents (based on XML) that are generated by EMR or EHR software systems and submitted to central cancer registries for the purposes of cancer reporting. The application is used by EMR/EHR vendors to validate cancer CDA documents generated by their products and by central cancer registries to validate cancer CDA documents during the on-boarding process for providers and prior to subsequent processing in eMaRC Plus.

CDA Validation Plus performs validations for both MU Stage 2 and MU Stage 3 formats, based on the specifications in their respective Implementation Guides:

1. [Implementation Guide for Ambulatory Healthcare Provider Reporting to Central Cancer Registries, August 2012, Release 1.0](#) ("Cancer IG"), which is the standard identified for MU Stage 2 cancer reporting objective.
2. [HL7 CDA ® Release 2 Implementation Guide: Reporting to Public Health Cancer Registries from Ambulatory Healthcare Providers, Release 1, DSTU Release 1.1 – US Realm](#), which is the standard identified for MU Stage 3 cancer reporting objective.



CDA Validation Plus does not **REPLACE** the testing and validation process that **MUST** be completed by EHR vendors with the Office of the National Coordinator - Authorized Testing and EHR Certification Bodies (ONC-ATCBs) to receive the required MU certifications. Rather it is used to **augment the validation process for improved interoperability in cancer reporting.**

The MU PH Reporting Requirements Task Force has provided guidance to public health agencies for on-boarding new providers, including recommendations for communicating results back to senders. Several useful documents, including: "MU2 PHA Readiness Guidance Recommendations Handbook", "Public Health Agency Readiness for Meaningful USE, 2015-2018", and "Functionality Recommendations for Registration of Intent and On-Boarding Process" can be found at: <https://www.cdc.gov/ehrmeaningfuluse/meaningful-use-mu-public-health-ph-reporting-requirements-task-force.html>.

On-boarding includes initial contact between the provider and the state registry, testing of data exchange, transport testing, content validation, and initiation of routine reporting. **It is imperative that central cancer registries use CDA Validation Plus to validate the content and structure of CDA cancer documents submitted to cancer registries from different EHR systems and providers during the on-boarding process and prior to subsequent processing in eMaRC Plus.**

System Requirements

CDA Validation Plus is programmed for the Microsoft Windows 32-bit environment installed on an Intel Pentium or Pentium-compatible computer. The minimum hardware requirements are the same as those of the Microsoft Windows operating system used. Additional system requirements include:

- Microsoft operating system from Windows 98 through Windows 8.0
- 128 MB RAM (512 MB minimum recommended)
- Latest version of Microsoft Internet Explorer (recommended)
- The available hard-disk space requirement for CDA Validation Plus depends on the number of CDA document validations that will be created and maintained in the database. A minimum of 70 MB of free hard drive space is required.

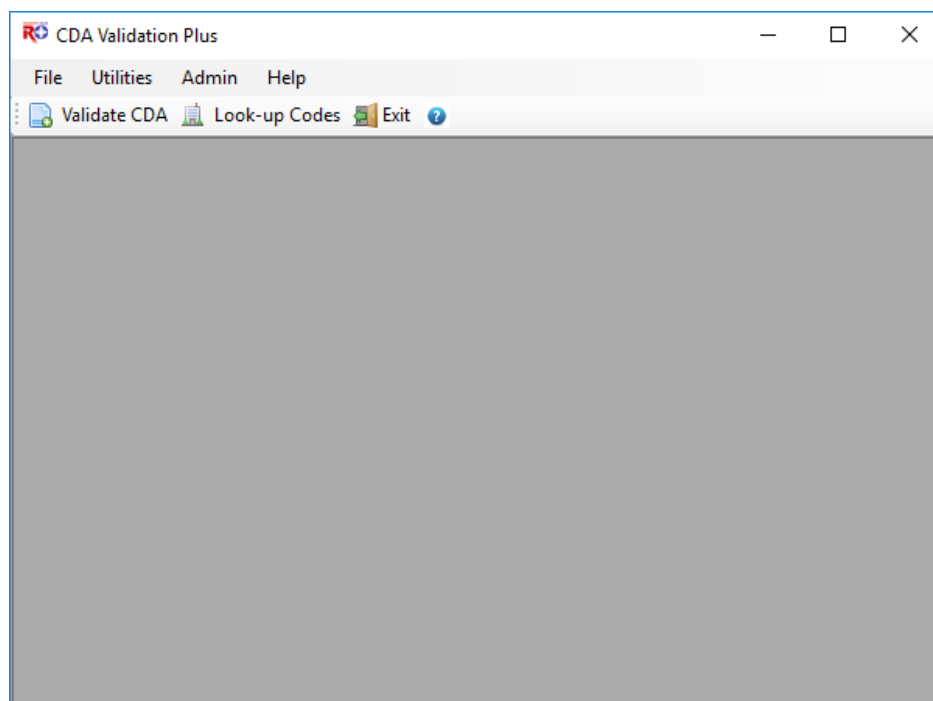
Launching CDA Validation Plus

Once installed, you can launch CDA Validation Plus:

1. This can be done in 2 ways:
 - a. From the Start menu, select **All Programs, Registry Plus, CDA Validation Plus,** and then **CDA Validation Plus.**
 - b. Double-click the CDA Validation Tool **shortcut icon** on your desktop (this is placed on your desktop when you install the program).



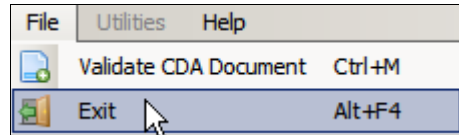
Result: The **CDA Validation Plus Main window** will open.



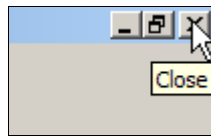
Exiting CDA Validation Plus

To exit CDA Validation Plus, complete these steps:

1. Exit CDA Validation Plus. This can be done in 4 ways:
 - a. Click on the **File** menu, and select **Exit**.



- b. Use the keystroke **Alt+F4**.
- c. Click the Exit icon  **Exit** on the tool bar.
- d. Click the **X** in upper right corner of screen.



Result: The CDA Validation Plus application **closes**.

User Support

For technical support via e-mail, or to provide feedback on the program, contact the **Helpdesk** at cancerinformatics@cdc.gov. The CDC Registry Plus Development group is funded primarily to support NPCR-funded state central cancer registries. CDA Validation Plus is intended for distribution to EMR and EHR vendors and central cancer registries. CDC will provide support to all end users, and welcomes all feedback regarding the program.

CDC also provides periodic software updates and problem-solving to the extent of available resources. CDC does not provide on-site services.

Chapter 2: CDA Validation Plus General User Basics

Learning Objectives

In this chapter, you will:

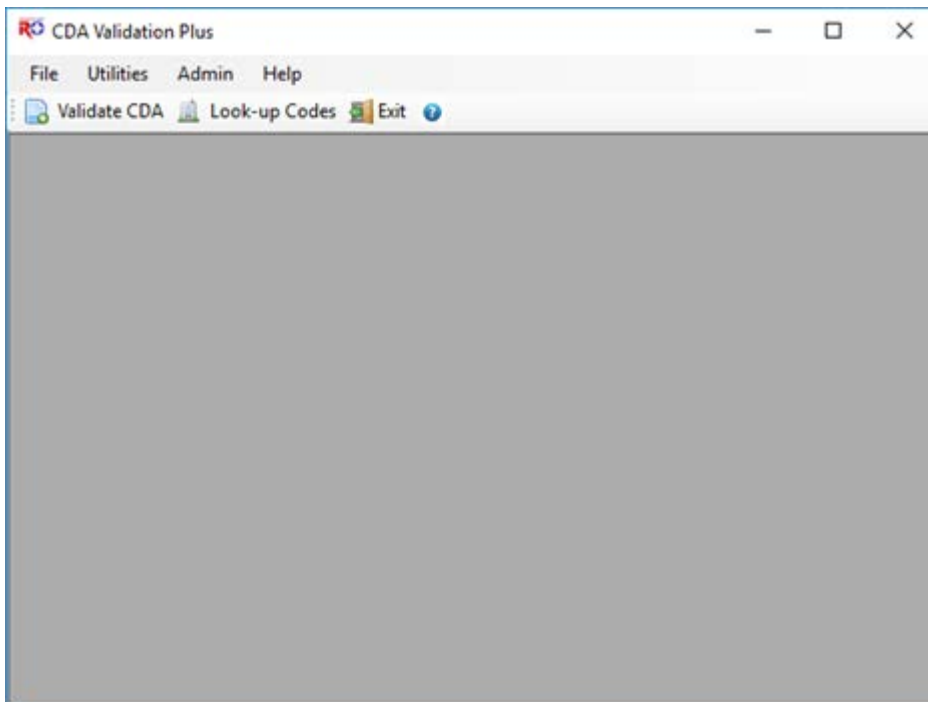
- Learn about the CDA Validation Plus File, Utilities, and Help menu items
- Learn how to validate a single CDA document, multiple CDA documents, or run the application in batch mode to validate all CDA documents in a user-specified folder
- Learn how to run the application from the DOS command line
- Become familiar with the validation and reporting features of CDA Validation Plus, including the validation rules applied to the CDA document, as well as the types of validation errors that may be generated

Overview

This chapter covers the all of the features available to end users of CDA Validation Plus. This chapter describes the various menu items and sub-options as well as the CDA document validation processes and the reporting features of the program.

The CDA Validation Plus Main Window

The CDA Validation Plus main window provides access to all of the application's features which are located under the File, Utilities, and Help menu items, and can also be accessed using the application's tool bar icons.

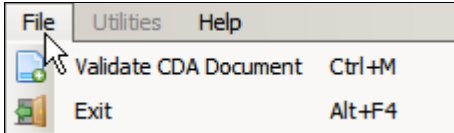


Keyboard and Mouse Alternatives

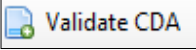

Keyboard and mouse alternatives are available for every function in the software. Note that Keystroke options are displayed on menus for all menu items, and [Appendix A](#) of this user guide contains a listing of standard CDA Validation Plus keyboard shortcuts to functions.

The File Menu

The File menu is used to access the main function of CDA Validation Plus, which is to validate the CDA document or documents provided by the user. To access the File menu items, click on the **File** menu item, and select the desired sub-option, or use the appropriate keystroke combination for the desired sub-option.



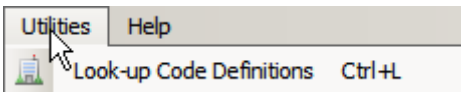
The following table describes the CDA Validation Plus File menu sub-options:

Sub-option (Keystroke)	Toolbar Icon	Function
Validate CDA Document (Ctrl+M)		Validate a cancer CDA document or documents that you load into to the application
Exit (Alt+F4)		Close the CDA Validation Plus application

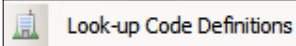
The Utilities Menu

The Utilities menu is used to access any supplementary functions included in the program. Currently the only utility provided is the ability to look-up code definitions for the codes based on various coding systems that are included in CDA documents.

To access the Utilities menu items, click on the **Utilities** menu item, and select the desired sub-option, or use the appropriate keystroke combination for the desired sub-option.



The following table describes the CDA Validation Plus Utilities menu sub-options:

Sub-option (Keystroke)	Toolbar Icon	Function
Look-up Code Definitions (Alt+L)		Look-up code definitions for codes based on the various coding systems that are included in CDA documents

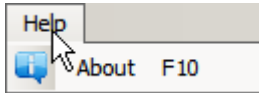
PLEASE NOTE: Due to development priorities, CDA Validation Plus is being released without the Look-up Code Definitions feature; description of the Look-up Code

Definitions feature provided in this guide is for informational purposes only. This functionality will be released in a future version of the program.


The Help Menu

The Help menu is used to access important versioning information included in CDA Validation Plus. As the software will continue to evolve and be refined, multiple versions of the software will be released.

To access the Help menu items, click on the **Help** menu item, and select the desired sub-option, or use the appropriate keystroke combination for the desired sub-option.



The following table describes the CDA Validation Plus Help menu sub-options:

Sub-option (Keystroke)	Toolbar Icon	Function
About (F10)		View CDA Validation Plus, Cancer IG, CDA versioning information, as well as contact information for inquires about the program

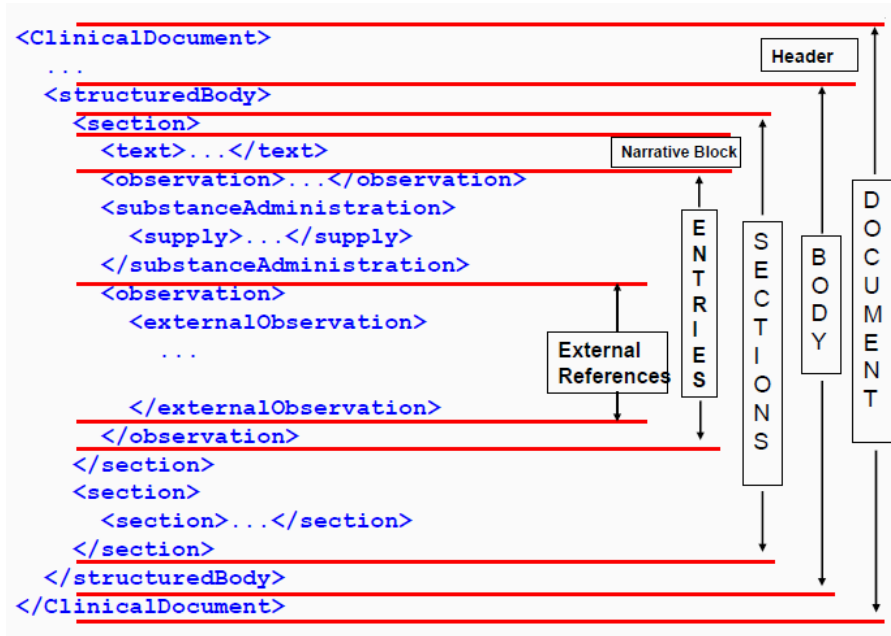
The CDA Validation Plus CDA Document Validation Process

CDA documents that are to be validated by CDA Validation Plus are the CDA documents reported by the physician EMR/EHR to the central cancer registry in the format specified by the Cancer IG. CDA is an XML document that consists of a header and a structured body. It is presented in this format: Header – includes patient information, author, creation date, document type, provider, etc. Body – includes diagnosis, patient details, medications, procedures, follow-up, etc. Information can be presented as free text in one or multiple sections, and also includes coded entries.

Major Components of a CDA Document

- A CDA document has a Header and a Body.
- A CDA document Body is comprised of Sections.
- A CDA Section contains one Narrative Block and zero to many Entries.
 - [1..1] Header
 - [1..1] Body
 - [1..*] Sections
 - [1..1] Narrative block
 - [0..*] Entries

Example of CDA XML Format Structure



The CDA Validation Process

CDA Validation Plus currently performs seven different types validation and includes both structural and content validation. All validation rules are based on the specifications identified in the Cancer IG. This tool is intended to be used in conjunction with, not as a substitute for, the [HL7 CDA Cancer Registry Reporting Validation Tool \(MU Stage 2\)](#) or the [Cancer Report Validator \(MU Stage 3\)](#) provided by the National Institute of Standards and Technology (NIST). The NIST validators were developed to evaluate conformance to the standards referenced by the Office of the National Coordinator for Health Information Technology (ONC) for cancer reporting.

CDA Validation Plus does not perform the structural validation rules that are already handled by the NIST validators; rather it assumes that documents have already passed through the NIST validator with no errors. CDA Validation Plus performs validation rules that will improve the interoperability between EMR/EHR systems and the cancer registry tool(s) developed to process the cancer CDA reports. It is not intended to be used for EHR certification purposes.

Content validation in CDA Validation Plus is based on the Value Sets and Code Systems identified in the Cancer IGs. Valid value sets for cancer reporting can be viewed and/or downloaded from the Public Health Information Network Vocabulary Access and Distribution System (PHIN VADS) at [Meaningful Use Healthcare Provider Reporting to Central Cancer Registries](#).

CDA Validation Process Steps and Validation Rules

Once a CDA document has been imported or copied into CDA Validation Plus, the basic process of validating a CDA document is as follows:

First the CDA document is checked for valid XML format structure, and then the following validation rules are applied to the CDA document and any invalid document structure, content, codes, and coding systems are identified:

- i. Critical missing required fields validation rule:
 - a. Verifies that a subset of required data elements that are considered critical to cancer registries are present in the CDA document.
 - b. Checks for a missing (empty) value of the data element as well as for a missing entire element (i.e., the Xpath for the data element is not found).
 - c. Identifies critical required fields that are either missing from the CDA document or are structurally invalid.
- ii. Missing required field validation rule:
 - a. Verifies that required data elements are present and are structurally valid.
 - b. Checks for a missing (empty) value of the data element as well as for an entirely missing element (i.e., the Xpath for the data element is not found).
 - c. Identifies required data elements that are either missing from the CDA document or are structurally invalid.
- iii. Invalid or unexpected null flavor validation rule:
 - a. Verifies that data elements that are either required to or expected to have non-null values do in fact contain non-null values.
 - b. Identifies missing values or unexpected null flavors for required data elements.
- iv. Invalid Code System Object Identifier (OID) validation rule:
 - a. Verifies that Code System OIDs are valid for their given coded data element.
 - b. Identifies Code System OIDs that are not valid for a given coded data element.
 - i. Displays valid Code System OIDs when an invalid one is provided in the document.
- v. Invalid values validation rule:
 - a. Uses look up tables to validate values for the specified Value Set(s) allowed for coded data elements.
 - b. Identifies values that are not valid according to the Value Set(s) allowed for coded data elements.
- vi. Check formatting validation rules and identifies any of these data items that have an invalid format:
 - a. **Social security numbers (SSN)**

All SSNs are exactly 9 digits long, and are in the format "xxx-xx-xxxx" or "xxxxxxxxxx", or "xxx xx xxxx", where "x" is a numeric digit (0 through 9). In either form the first three digits are referred to as the "Area Number", the middle two digits are the "Group Code" and the final four digits are the "Serial Number".

 - i. Valid formats: "xxx-xx-xxxx", "xxxxxxxxxx" and "xxx xx xxxx".
 - ii. The area numbers "000" and "666" are invalid (based on Social Security Administration assignment rules).

- iii. All numbers between "900" and "999" are invalid (based on Social Security Administration assignment rules).

b. Dates

- i. Invalid date formats:
 - 1. Cannot be greater than 14 digits.
 - 2. Cannot be odd number of digits.
 - 3. Cannot be 2 digits.
 - 4. 1, 2, 3, 5, 7, 9, 11, 13 and greater than 14 digits are invalid formats.
- ii. Valid date formats:
 - 1. Date should have an even number up to 14 digits.
 - 2. 4, 6, 8, 10, 12, 14 digits are valid formats.
 - 3. YYYYMMDDHHMMSS +/-[ZZzz] where +/-[ZZzz] is optional time zone offset. Time zone offset when given should be exactly 4 digits. If anything followed by +/- is less than 4 digits it is invalid.

c. NPI numbers (10 numeric digits)

- i. Physician NPI can be reported in any of 3 areas in the CDA Document. CDA Validation Plus should only produce an error when all 3 of these CDA data elements are empty.
- ii. If Author NPI AND Physician NPI (Service Event) AND Physician NPI (Encompassing Encounter) are empty (missing OR null flavor), produce a "Missing required field" error type; error level "Error"; and the following error message: "The document does not contain any of the possible physician NPI numbers that map to the NAACCR NPI--Physician—Managing or NPI--Physician--Follow Up" items."

d. CPT codes

Valid formats for Code System OID == "2.16.840.1.113883.6.12":

- i. 5 numeric digits.
- ii. 5 numeric digits, followed by a dash, followed by 2 numeric digits.

e. HCPCS codes

Valid formats for Code System OID == "2.16.840.1.113883.6.285":

- i. A single alphabetical letter followed by 4 numeric digits.
- ii. A single alphabetical letter, followed by 4 numeric digits, followed by a dash, followed by 2 characters (number or letter).

vii. Cancer Reportability validation rule:

- a. Verifies that the cancer diagnosis entry represents a reportable cancer.
- b. Identifies any documents that may not represent a reportable cancer.

NOTE: Not all code systems/value sets are validated in the current version of this tool. Some may be added in future versions. The following validations are not currently being performed:

1. Procedure Code (Related to results):
 - a. CPT-4 (Code System OID: 2.16.840.1.113883.6.12)
 - b. LOINC (Code System OID: 2.16.840.1.113883.6.1)
2. Procedure Codes:
 - a. CPT-4 (Code System OID: 2.16.840.1.113883.6.12)
 - b. LOINC (Code System OID: 2.16.840.1.113883.6.1)
3. Medication and Medication Administered Product Codes:
 - a. RX Norm (Code System OID: 2.16.840.1.113883.6.88). RX Norm is updated on a very frequent basis, so the decision was made to remove validation of values in this code system from the tool.
4. Type of Primary Payer at Dx Code
 - a. X12 Insurance Type Code (Code System OID: 2.16.840.1.113883.6.255.1336 and 2.16.840.1.113883.6.255)

Missing Required Fields: XML Error Examples

As stated earlier, “missing required field” errors can occur for one of three reasons:

- 1) The value of the data element is missing (empty).
 - a) The data element can be present, but the actual value missing, which will produce the error “[data element name] is not present or is structurally incorrect”.

Example XML for string data type:

```
<patient>
  <name>
    <given>John</given>
    <given>Jacob</given>
    <family></family>
  </name>
```

Example XML for a coded data element (attribute “code” is missing):

```
<administrativeGenderCode codeSystem="2.16.840.1.113883.5.1"
codeSystemName="HL7 Administrative Gender"/>
```

- 2) The entire element missing from the CDA document (i.e., the Xpath for the data element is not found).
 - a) The entire data element can also be missing, which will produce the error “[data element name] is not present or is structurally incorrect”.

Example XML with last name (“family”) missing:

```
<patient>
  <name>
    <given>John</given>
    <given>Jacob</given>
  </name>
```

- 3) The structure of the data element is not valid according to the cancer CDA specifications.

- a) If the Xpath for a data element is not found it may have an invalid structure. The Xpaths for elements within sections use one of the required section template IDs to uniquely identify sections. So, if an Xpath is missing, it could be due to a missing required template ID. The following example will produce the error “Active Problem Start Date is not present or is structurally incorrect”, even though the Active Problem Start Date is present, because the required template ID 1.3.6.1.4.1.19376.1.5.3.1.3.6 is not present:

Example XML:

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.5.1" />
  <id root="xxx" />
  <code code="11450-4" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="PROBLEM LIST" />
  <title>Problems</title>
  <text>Cancer Dx test</text>
  <entry typeCode="DRIV">
    <act classCode="ACT" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.22.4.3" />
      <id root="yyy" />
      <code nullFlavor="NA" />
      <statusCode code="completed" />
      <effectiveTime>
        <low value="20130911144901" />
        <high value="20130911144901" />
      </effectiveTime>
    </act>
  </entry>
</section>
```

- b) The Xpath also may not be found because there is an incorrect, missing, or extra act/entry/entry relationship/qualifier, etc. The following example will produce the error “Active Problem Start Date is not present or is structurally incorrect”, because the Xpath cannot be found due to an incorrect act type (“observation” instead of “act”):

Example XML:

```
<section>
  <templateId root="2.16.840.1.113883.10.20.1.11" />
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.6" />
  <templateId root="1.3.6.1.4.1.19376.1.7.3.1.3.14.1" />
  <id root="abc123" />
  <code code="11450-4" displayName="Problem List"
codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
  <title>Cancer Diagnosis</title>
  <text>Malignant neoplasm of prostate</text>
  <entry typeCode="DRIV">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.1.27" />
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1" />
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2" />
      <id root="def456" />
      <code nullFlavor="NA" />
      <statusCode code="active" />
      <effectiveTime>
        <low value="20120402" />
      </effectiveTime>
    </observation>
  </entry>
</section>
```


Critical Missing Required Fields versus Required Missing Fields

When the error “Missing required field” is issued, the errant data element is indicated as a “critical field” or a “required field”. Data elements denoted as “critical required” are a subset of required data elements that are considered critical to cancer registries, and are required to be included in the CDA document. Data elements denoted as “required” are a subset of required data elements that are usually required by cancer registries, but that are not formally required to be included in the CDA document.

As a result, vendors and cancer registries need to assess all Missing Required Field errors based on the type of error message; “critical missing” or “required missing” and for those data elements identified as required missing, errors should be assessed for reason the error is generated and followed up by the registry accordingly:

1. The value of the data element is missing (empty).
2. The entire element missing from the CDA document (i.e., the Xpath for the data element is not found).
3. The structure of the data element is not valid according to the cancer CDA specifications.

Items 2 and 3 are structural errors that have to be corrected, however an error based on item 1 might be acceptable depending on the identified data element.



Tip

CDA Validation Plus was designed to help registries and vendors to optimize the CDA document as a reporting source for cancer registries, as well as with the on-boarding process. With the exception of identified missing required data elements and unexpected null flavors, all other errors identified by the application must be corrected. Registries may want to take advantage of the [automatically-generated Excel-formatted Validation Report](#), adding an additional column to indicate whether the identified error is required by the registry to be fixed and forwarding to the submitting vendor/organization.



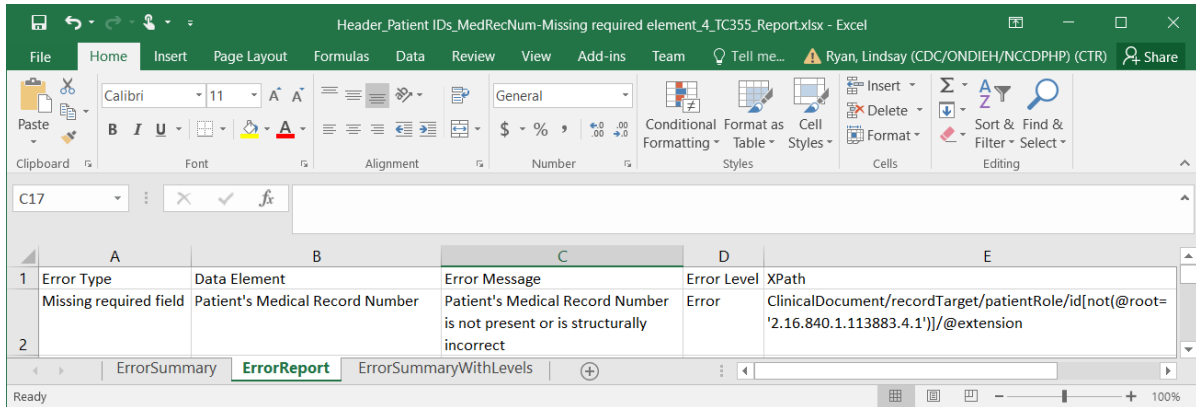
Error Levels

CDA Validation Plus has the ability to distinguish between different levels of error. There are four error levels: **Critical, Error, Warning, and Info**. For every error type there is an assigned error level. This new feature has been added to help registries better prioritize issues identified in testing.

Error Level	Description
Critical Error	This is a required field and must be completed.
Error	This field should be completed in most cases. Frequent errors of the same type can help identify patterns from the same provider.
Warning	This field is not as critical; shouldn't delay testing. Frequent errors of the same type can help identify patterns from the same

	provider.
Info	For information purposes only; shouldn't delay testing.

For example, Patient's Medical Record Number is not a critical data element for Stage 3, but does have an Error level type for Missing Required Field; therefore, if this field is missing the validation report will display an Error Type of Missing Required Field and an Error Level of Error:



This feature has been added to the Validation View, Report Viewer and Excel Report (shown above).

Validation View

CDA Validation Report for all Documents

Please double click on the row to view the detailed validation report:

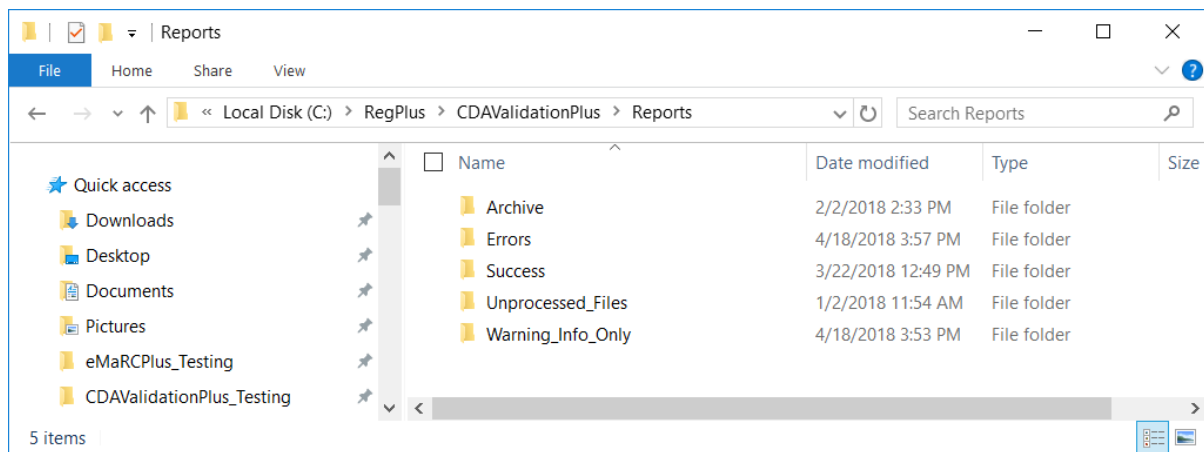
1 CDA documents are processed out of 1 CDA documents

Status	CDA Document Name	Total	Number Of Critical Errors	Number Of Errors	Number Of Warnings	Number Of Info	View Message
Processed	\\cdc.gov\project\VCCHP_NCCD_DCPC_HIRSOX\W2LXML_Test_Cases\Diagnosis_3_entries_first and middle Histology_invalid NULL.xml	5	2	0	0	3	Raw Message

Report Viewer

Data Element	Error Message	Error Level	Error Type	XPath
Histology Code	Critical Field: A null flavor is not expected for the required data element Histology Code	Critical	Null Flavor	ClinicalDocument/component/structuredBody/component/sec[@root='1.3.6.1.4.1.19376.1.5.3.1.3.6']/entry/act/entryRelatc[@root='1.3.6.1.4.1.19376.1.7.3.1.4.14.1']/value/@code

CDA Validation Plus will determine the success or error based on error level. Once the file is processed, the tool will place the reports in the appropriate folder. The “Errors” folder will contain files that have at least one Critical or Error level errors. The “Warning_Info_Only” folder will contain files that only have warning and/or info level errors. The Success and Unprocessed_Files will remain the same (as described further below).



Repeating Fields

(See release notes for known issues related to Repeating Fields)

Many data elements can occur more than once in a single CDA document; we refer to these as “repeating fields”. For example, two cancer diagnoses will be reported in the same document. In this case, there will be two histology codes, two primary sites, etc. Rules have been developed to provide error messages for various error types given different scenarios for repeating fields.

Note: when a repeating element has errors on two or more instances, you may see multiple errors with the same message.

The following rules are applied for repeating fields. The table in Appendix C identifies which data elements follow which rules.

- i. **Missing Required Field:**
If at least one of the repeats has a value, the tool does not produce any error. If all of the repeats are missing, the tool produces one Missing Required Field error. (Tool treats both the missing XPath as well as value in the XPath missing as the same for this error type). If all of the repeats have no values but have Null Flavors, the tool does not produce any error.
- ii. **Missing Required Field and Invalid Value:**
If the XPath is missing, the tool produces one Missing Required Field error message. For “Missing Required Field” error types, if the value in the XPath is missing, the tool does not produce any error. For “Invalid Value” error type, the tool produces the Invalid Value error for every repeat where the value in the XPath does not match any of the valid values in the lookup table.
- iii. **Missing Required Field and Invalid Value and Null Flavor:**
If the XPath is missing, the tool produces one Missing Required Field error. If the XPath is given then:

- a. The tool checks to see if there is any Null Flavor given; if the element has a Null Flavor, the tool produces one Null Flavor error message. (Only one Null Flavor error is produced for all the Null Flavors given in the message)
 - b. If the XPath has no Null Flavor only, the tool checks for the value in the XPath; when there is no value for every repeat the tool produces a Missing Required Field error.
 - c. If the XPath has a value, the tool checks to see if that value is in the lookup table; if the value does not match any of the valid values in the lookup table, then for every repeat the tool produces the Invalid Value error.
- iv. **Missing Required Field and Null Flavor (Non-Cancer Section):**
For all sections other than the Cancer Diagnosis Section, the tool produces a Missing Required Field error for every missing field (missing XPath or empty values in the XPaths). If all of the repeats have Null Flavors, the tool produces only one Null Flavor error message. If at least one of the repeats has a value and the rest have Null Flavors, the tool does not produce any error. If some of the repeats have Null Flavors and some repeats are missing, the tool produces one Null Flavor error message.
- v. **Missing Required Field and Null Flavor (Cancer Diagnosis Section):**
For data elements in the Cancer Diagnosis Section, for every repeat the tool checks to see if a value is given. If the value is missing, the tool checks for a Null Flavor and produces a Null Flavor error for every repeat where a Null Flavor is given, and a Missing Required Field error for the other repeats.
- vi. **Missing Required Field and Null Flavor and NPI Number Formatting:**
For every repeat the tool checks to see if a value is given. If a value is missing, the tool checks for a Null Flavor and produces Null Flavor error for every repeat where a Null Flavor is given, and a Missing Required Field error for the other repeats. If a value is given, the tool checks for the format; if the format is not correct, the tool produces an NPI Number Formatting error.
- vii. **Missing Required Field and Social Security Number Formatting:**
If the XPath is missing, the tool produces the Missing Required Field error message. If the XPath has some value, the tool checks the format for every repeat. If the format is wrong, the tool produces the SSN Formatting error.
- viii. **Invalid Value:**
If the XPath has some value, the tool checks the lookup table to see if it's a valid value. If the value is invalid, the tool produces the Invalid Value error for every repeat. If the value in the XPath is missing, the tool does not produce any error.
- ix. **Invalid Code System OID:**
The tool produces an Invalid Code System OID error for every repeat where the OID is invalid.
- x. **Invalid Code System OID and Invalid Value:**
For every repeat, the tool first checks to see if the given OID is valid. If the OID is invalid, the tool produces the Invalid Code System OID error. If the OID is valid, the

tool checks the lookup table to see if it's a valid value; if the value is invalid, the tool produces the Invalid Value error for every repeat.

xi. Date Formatting:

If the XPath has some value, the tool checks the format to see if it has a valid date format. If the date is not in the valid format, the tool produces the Date Formatting error for every repeat.

xii. Missing Required Field and Date Formatting:

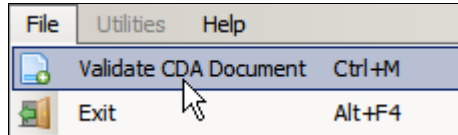
If a valid date or a Null Flavor is found in at least one of the repeats and the other repeats are missing, the tool does not produce any Missing Required Field error. If the date is missing in all of the repeats, the tool produces one Missing Required Field error. If the date is given, for every repeat the tool checks to see if the date is formatted correctly and produces an Invalid Date format error for every repeat where the date is not valid.

Validating CDA Documents

As mentioned earlier, the primary function of CDA Validation Plus is to validate the structure, content, codes, and coding systems of CDA documents (based on XML) that are generated by EMR or EHR software systems and submitted to central cancer registries for the purposes of cancer reporting.

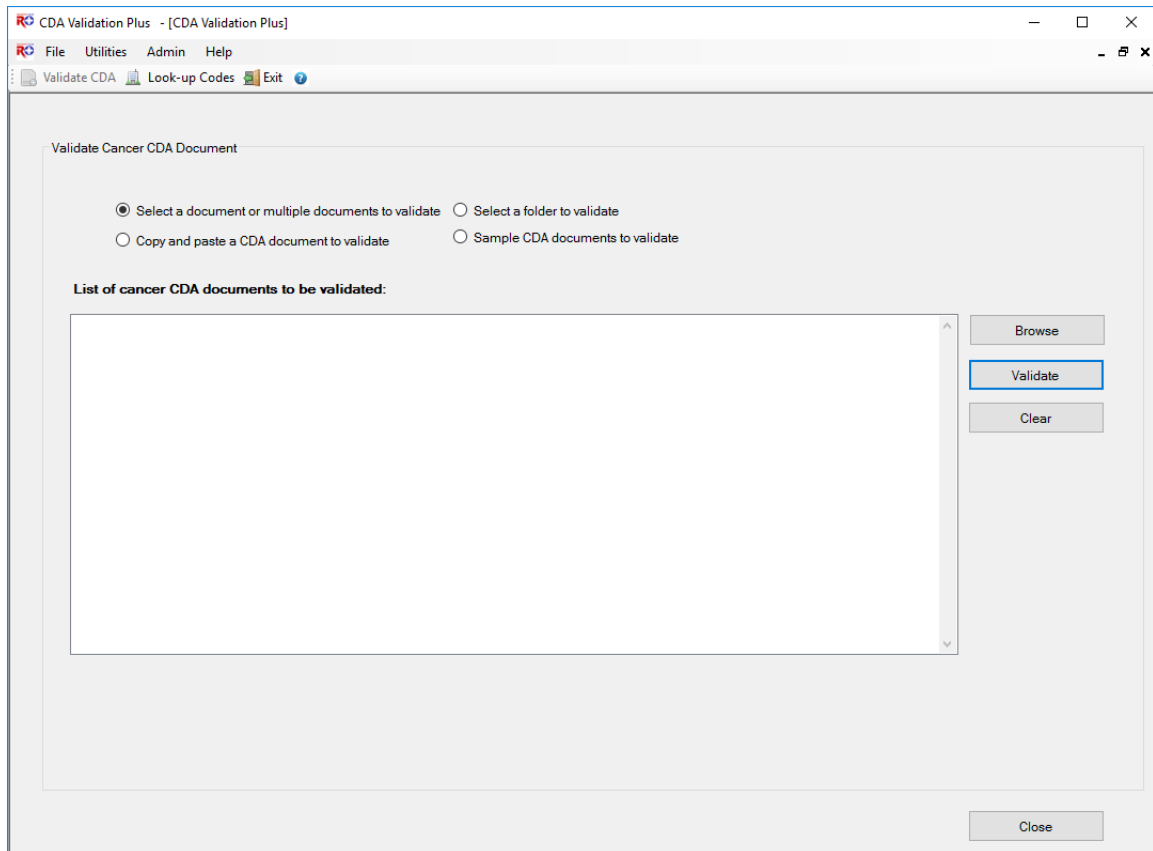
To use CDA Validation Plus to validate a CDA document, complete these steps:

1. Open the **Validate Cancer CDA Document** window. This can be done in 3 ways:
 - a. Click on the **File** menu, and select **Validate CDA Document**.



- b. Use the keystroke **Ctrl+M**.
- c. Click on the  **Validate CDA** Toolbar icon

Result: The **Validate Cancer CDA Document** window opens.



CDA Validation Plus offers four different options for loading an individual CDA document or multiple documents into the application for validation:

Validate CDA Document Option	Function
Select a document or multiple documents to validate	Use this option if you are an EMR or EHR software vendor to browse to a test document or documents produced by your EMR/EHR software, or if you work in a central cancer registry use this option to browse to a test document or documents submitted to you from your EMR/EHR software vendor and upload into the application
Select a folder to validate	Use this option if you are an EMR or EHR software vendor to browse to a folder that contains multiple documents produced by your EMR/EHR software, or if you work in a central cancer registry use this option to browse to a folder that contains multiple documents submitted to you from your EMR/EHR software vendor and upload all documents in the specified folder into the application
Copy and paste a document to validate	Use this option if you would like to manually copy and paste a CDA document into the application document window
Sample document to validate	The application also comes with a couple of sample documents that you can validate in order to familiarize yourself with the program; select this option if you would just like to familiarize yourself with the validation process

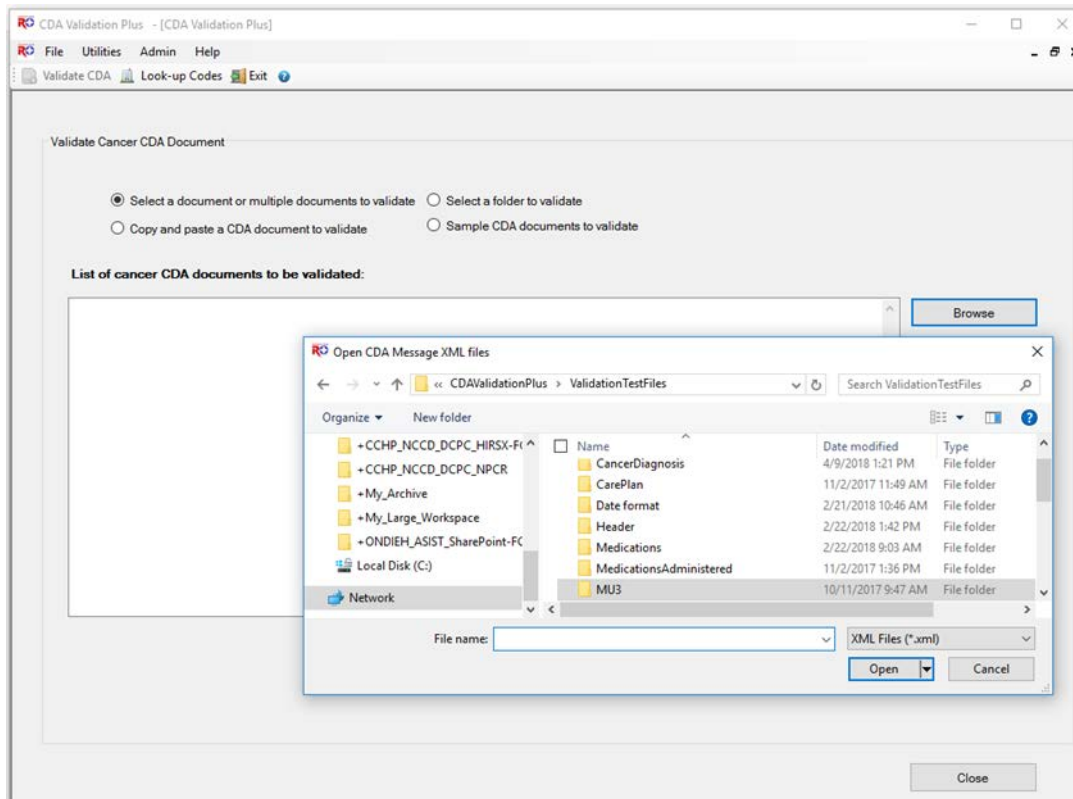
When the Validate Cancer CDA Document window opens, the Select a document or multiple documents to validate option is selected by default.

Using the Select a Document(s) to Validate Option

As mentioned earlier, CDA Validation Plus was designed to be used by EMR/EHR vendors to validate cancer CDA documents generated by their products and by central cancer registries to validate cancer CDA documents prior to subsequent processing in eMaRC Plus. As a result, the application provides the option for the user to upload single or multiple test documents produced by EMR/EHR vendor software, or to upload documents submitted to a cancer registry from their EMR/EHR software vendors into the application.

To upload a single CDA document or multiple documents, complete these steps;

1. On the **Validate Cancer CDA Document window** click **Select a document or multiple documents to validate**.
2. Click **Browse**.

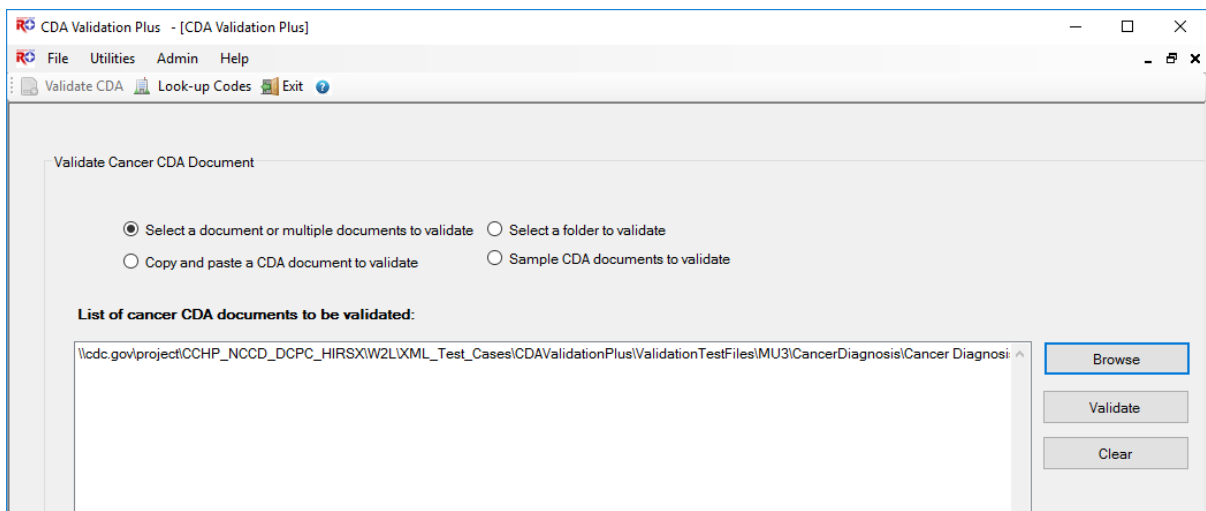


Result: The **Open CDA Document** window opens (defaulted to the **C:\RegPlus\CDAValidationPlus\IMPORTS** folder, however, you can navigate to the Cancer CDA document location anywhere on your computer or network).

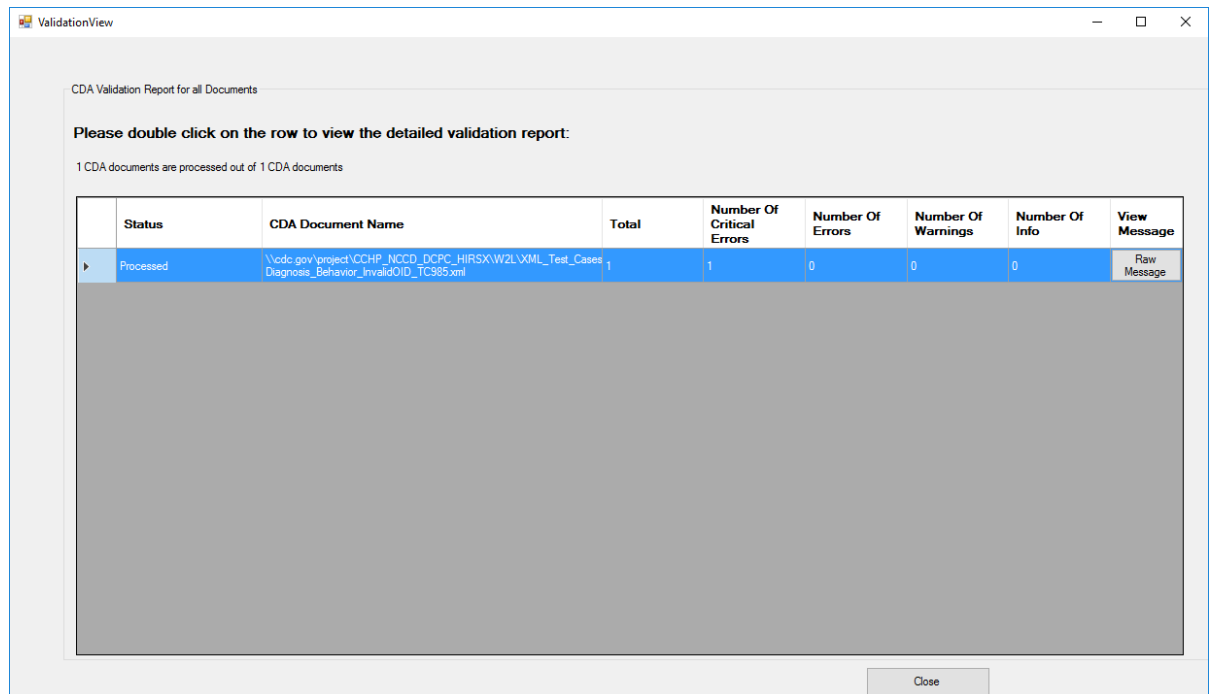
3. **Select** the CDA document or documents that you would like to validate, and click **Open**. To select multiple documents to open, you can hold the Shift key down while left-clicking on the documents you want to select. In the example shown, a single document being selected and imported and is named **Physician_CDA.xml**.

Result: You are returned to the **Validate Cancer CDA Document** window, where the name and path of the document selected for import is displayed.

4. Click **Validate**.



Result: The CDA **ValidationView** window opens where information on identified validation errors is displayed in the validation results grid.



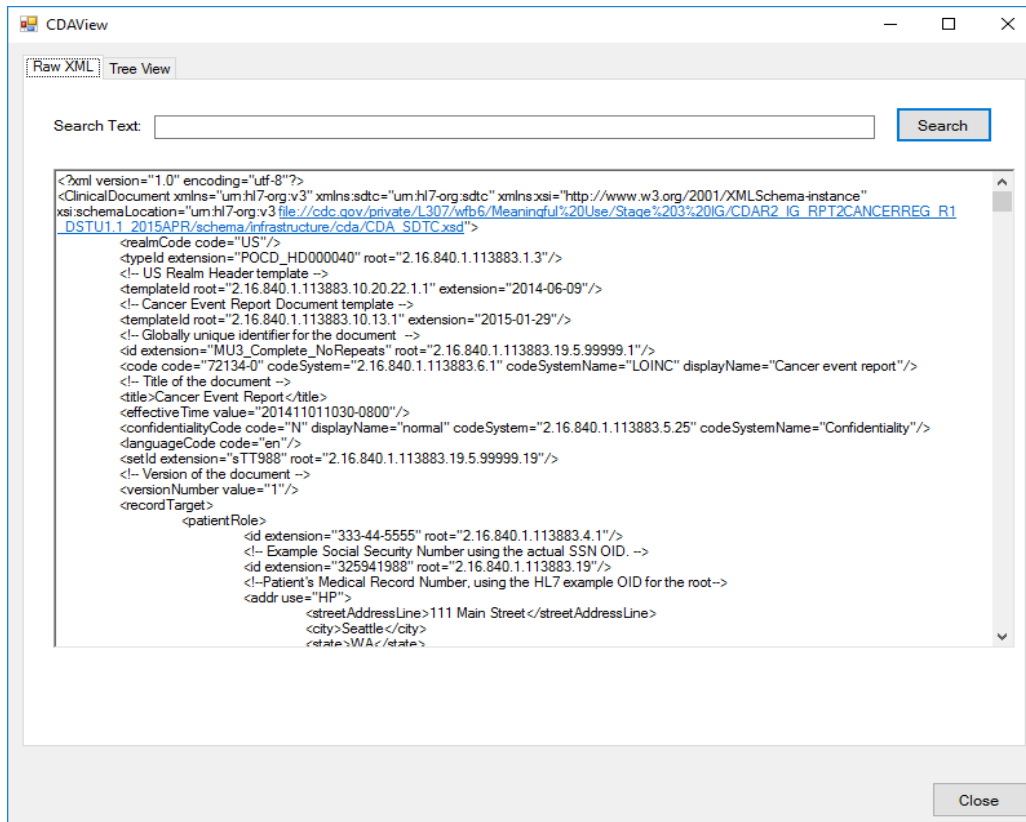
Each row displayed on the validation results grid represents a single CDA document and its validation results. If validating multiple CDA documents, multiple rows will be displayed. To view the actual Validation Report, double-click on the row of the CDA document for which you would like to view the report.

The ValidationView results grid includes these rows:

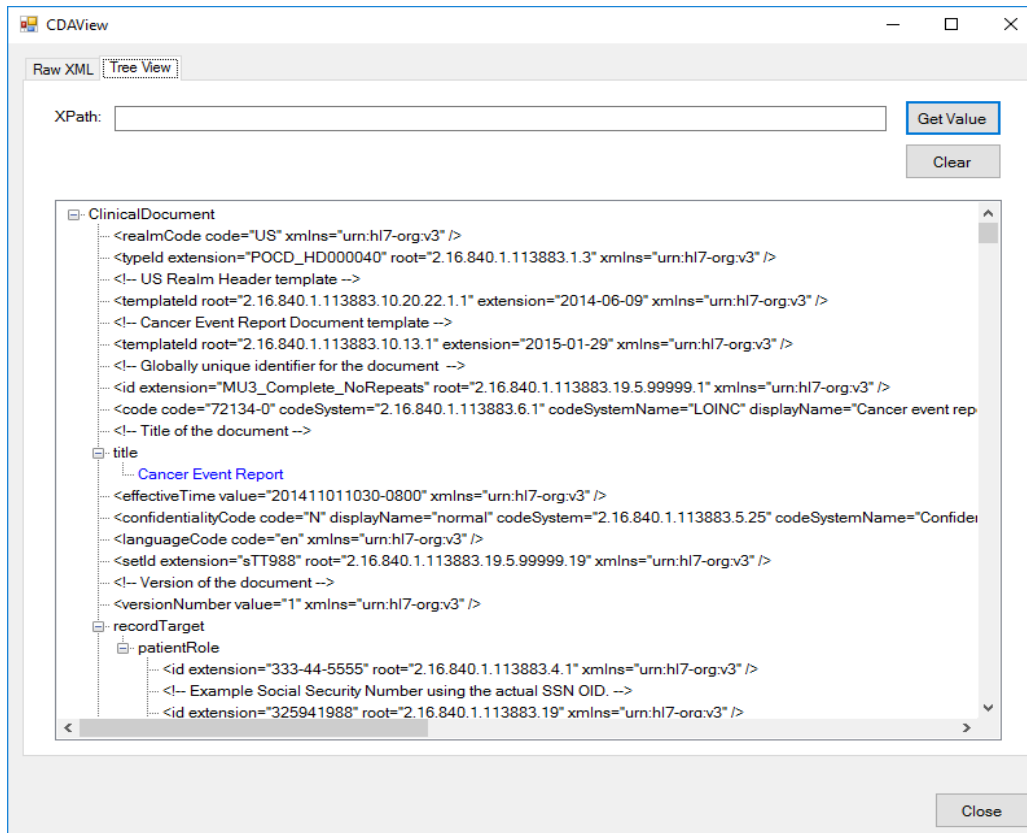
Column	Description
Status	The file status, processed or unprocessed
CDA Document Name	The name and original file path of the CDA document
Total	The total number of validation errors (if any) found upon validation of the file
Number of Critical Errors	The total number of validation errors (if any) with Error Level of “Critical”
Number of Errors	The total number of validation errors (if any) with Error Level of “Error”
Number of Warnings	The total number of validation errors (if any) with Error Level of “Warning”
Number of Info	The total number of validation errors (if any) with Error Level of “Info”
View Message	Allows the user to view the raw CDA document by clicking on Raw Message

5. Click **Raw Message**.

Result: The **CDA Message View** window opens, and by default displays the CDA in its raw XML format. A helpful **text search** is included in the window, so that once validation errors are identified, you can search the document for a specific term in order to view the errant portion of the document to assess exactly what is causing the error.



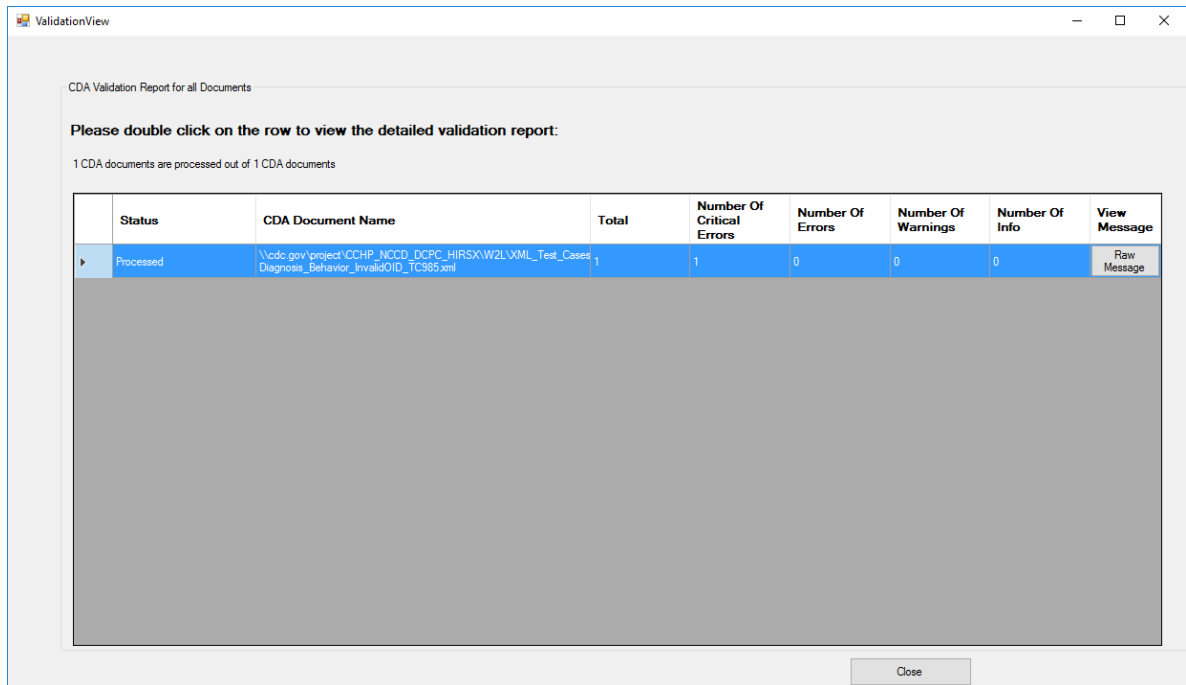
The **CDA Document View** window also provides the option of viewing the document using a **Tree View** structure, which greatly facilitates the viewing of the document. To view the document using the Tree View, click the **Tree View** tab.



The Tree View option allows the user to search the CDA document using the errant Xpath provided by the application (see below), so that once validation errors are identified, you can go directly to the Xpath that includes the errant portion of the document to assess exactly what is causing the error. Just copy and paste the errant Xpath into the Xpath box and click **Get Value**. Also, in the area where Xpath is entered, you have the ability to either clear the Xpath or double click and select the entire Xpath, to make it easier to enter a new one.

6. Click **Close** to close the CDAView window.

Result: The CDAView window closes and you are returned to the ValidationView window.



7. **Double-click on the row of the CDA document** for which you would like to view the Validation Report.

Result: The **CDA Document Validation Report** opens in the CDA Validation Plus **Report Viewer**, where information on identified validation errors is displayed.

The CDA Validation Report

CDA Validation Plus Version 3.0.0.0																								
CDA Document Validation Report																								
Thursday, April 19, 2018 2:22:49 PM																								
CDA document Name with path: \\cdc.gov\project\CCHP_NCCD_DCPC_HIRSI\W2LXML_Test_Cases\CDAValidationPlus\ValidationTestFiles\MU3\CancerDiagnosis_ClinStageGroup_InvalidValue_TC1022.xml																								
<table border="1"> <thead> <tr> <th>Error Type</th> <th>Number of Errors</th> </tr> </thead> <tbody> <tr> <td>Missing required field</td> <td>0</td> </tr> <tr> <td>Invalid Value</td> <td>1</td> </tr> <tr> <td>Cancer Reportability</td> <td>0</td> </tr> <tr> <td>Null Flavor</td> <td>0</td> </tr> <tr> <td>Invalid Code System OID</td> <td>0</td> </tr> <tr> <td>Social Security number formatting</td> <td>0</td> </tr> <tr> <td>NPI number formatting</td> <td>0</td> </tr> <tr> <td>Date formatting</td> <td>0</td> </tr> <tr> <td>Total Errors</td> <td>1</td> </tr> </tbody> </table>					Error Type	Number of Errors	Missing required field	0	Invalid Value	1	Cancer Reportability	0	Null Flavor	0	Invalid Code System OID	0	Social Security number formatting	0	NPI number formatting	0	Date formatting	0	Total Errors	1
Error Type	Number of Errors																							
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Invalid Value	1																							
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Total Errors	1																							
<table border="1"> <thead> <tr> <th>Data Element</th> <th>Error Message</th> <th>Error Level</th> <th>Error Type</th> <th>XPath</th> </tr> </thead> <tbody> <tr> <td>TNM Clinical Stage Group Code</td> <td>V is not a valid value in the Value Set 2.16.840.1.113883.3.520.4.9</td> <td>Error</td> <td>Invalid Value</td> <td>ClinicalDocument/component/structuredBody/component/section[jm:templateId[@root="2.16.840.1.113883.10.13.2"]]entry/act/entryRelationship/observation/entryRelationship/observation[jm:code[@code="75620-5"]]entryRelationship/observation/value/@code</td> </tr> </tbody> </table>					Data Element	Error Message	Error Level	Error Type	XPath	TNM Clinical Stage Group Code	V is not a valid value in the Value Set 2.16.840.1.113883.3.520.4.9	Error	Invalid Value	ClinicalDocument/component/structuredBody/component/section[jm:templateId[@root="2.16.840.1.113883.10.13.2"]]entry/act/entryRelationship/observation/entryRelationship/observation[jm:code[@code="75620-5"]]entryRelationship/observation/value/@code										
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TNM Clinical Stage Group Code	V is not a valid value in the Value Set 2.16.840.1.113883.3.520.4.9	Error	Invalid Value	ClinicalDocument/component/structuredBody/component/section[jm:templateId[@root="2.16.840.1.113883.10.13.2"]]entry/act/entryRelationship/observation/entryRelationship/observation[jm:code[@code="75620-5"]]entryRelationship/observation/value/@code																				
Page 1 of 1																								

The Validation Report window includes these sections and options:

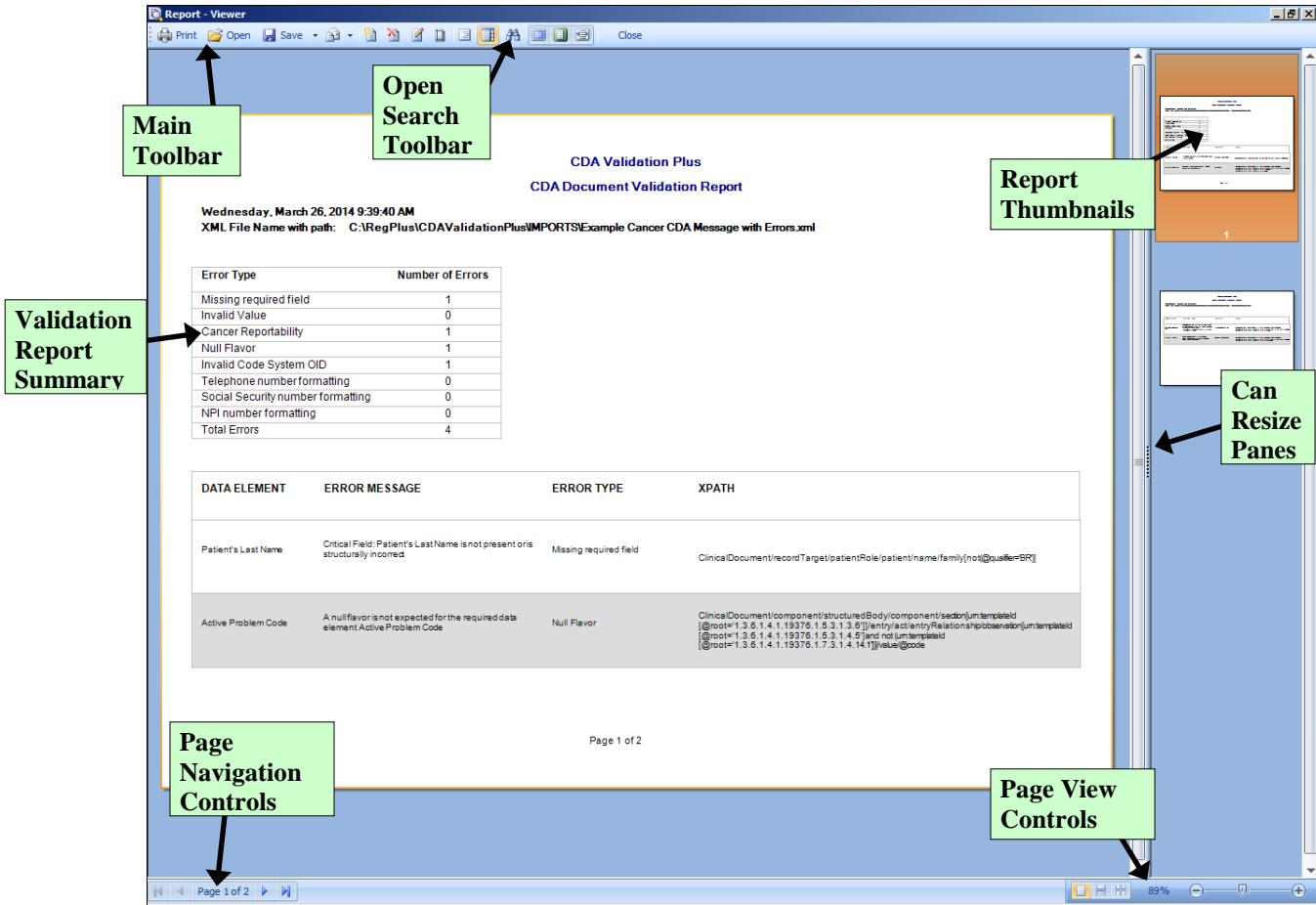
Section/Option	Description
Report Header	The Validation Report header is located in the upper left-hand corner of the Validation Report and includes the name and original location of the imported CDA document and the date the report was run
Validation Report Error Summary Information	The Error Summary is located directly below the Report Header in the upper left-hand corner of the Validation Report and includes a summary of the number of validation errors identified by Error Type as well as the overall total number of identified errors
Validation Report Error Section	The Validation Error Section is listed below the Error Summary and includes a line listing of identified errors grouped by Error Type

The Validation Report Error Section

The Validation Error Grid includes a line listing of identified errors that can be scrolled through vertically. Errors are listed by Error type, Error level and the following information is included for each listed error:

Column	Description
Data Element	This column identifies the specific data element that has an error; please see Appendix B for a detailed listing of data elements assessed by each validation rule
Error Message	This column includes a detailed error message specific to the identified errant data element
Error Type	The Error Type is the overall type of error that was identified: <ul style="list-style-type: none"> – Critical Missing Required Field – Missing Required Field – Unexpected Null Flavor – Invalid Value – Invalid Code System OID – Formatting Errors <ul style="list-style-type: none"> ▪ Social Security Number ▪ NPI Number ▪ Date ▪ CPT Code ▪ HPCPS Code – Cancer Reportability
Error Level	The Error Level identifies whether the Error Type is Critical, Error, Warning or Info
Xpath	This column displays the Xpath to the exact location of the error in the CDA document

Viewing Validation Reports – The Report Viewer Window


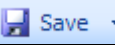











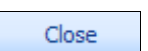
The CDA Validation Plus Report Viewer window is divided into 2 main sections: a window in which to view reports on the left, and a pane for viewing report thumbnails on the right. When you left-click and hold your mouse on the vertical divider bar in the center of the window, a splitter appears which you can drag to the left or right to resize the view report and thumbnails views.

The Main Toolbar



The Report Viewer Main Toolbar includes icons to print and save the report being viewed, as well as modify the current view of the report. The following table describes the function of each of the icons on the Main Toolbar, as well as listing keystroke equivalents where available for each function.



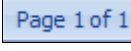
Icon	Keystroke	Function
	Ctrl+P	Print the report being viewed; opens the print dialog window
	Ctrl+O	Save the report being viewed to various file formats



Icon	Keystroke	Function
	Ctrl+Shift+S	Change report page setup: size, orientation and margins
	Ctrl+B	Show/hide the tree of bookmarks of the report being viewed; bookmarks are displayed by default---if there are no bookmarks in the report the Report Viewer will automatically hide the tree of bookmarks
	Ctrl+T	Show/hide the thumbnail view of reports in the pane on the right
	Ctrl+F	Search; Open the Search Toolbar
	F2	View the report in full screen mode
	F3	View the report one page at-a-time
	F4	View the report 2 pages at-a-time
	No keystroke	View multiple pages of the report at-a-time; specify 1x2, 2x3, etc.
	F5	Control page width; when clicked report will enlarge to the page width of Report Viewer window
	No keystroke	Close a report

Page Navigation Controls




Report page navigation controls are located in the lower left-hand corner of the Report Viewer window and help you navigate through the various pages of the report being viewed. The following table describes the function of each of the page navigation controls.

Control	Function
	View the first page of the report being viewed
	View the previous page of the report being viewed
	Lists the page number of the current page of the report being viewed


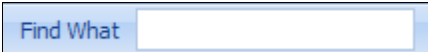
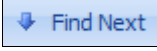
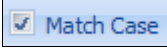
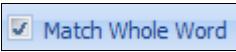
Control	Function
	View the next page of the report being viewed
	View the last page of the report being viewed

The Search Toolbar

The search panel is used to search for specific text within the report. To access feature, click the binocular icon  on the main toolbar.




When opened, the Search Toolbar is located in the lower left-hand corner of the Report Viewer window directly over the Page Navigation controls. The following table describes the function of each of the Search toolbar icons.




Icon	Function
	Closes the Search Toolbar
	Enter the term being searched for in the Find What box
	When clicked, searches the report and finds the next occurrence of the search term entered in the Find What box
	When checked, the search is repeated with case of the search term considered
	When checked, the search is repeated with only whole words of the search term considered

Page View Controls



Report page view controls are located in the lower right-hand corner of the Report Viewer window, and include icons to help you control how many pages of the report to view, as well as to zoom in or out on the current report being viewed. The following table describes the function of each of the page view controls.

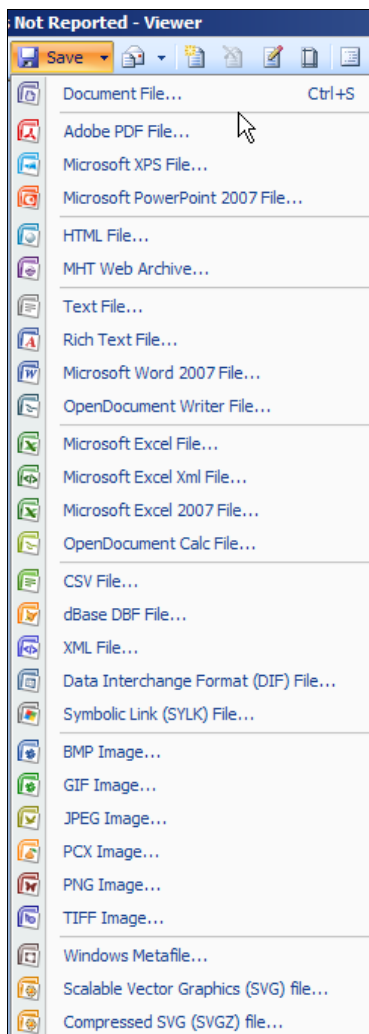
Control	Keystroke	Function
	Shift+F2	Single Page: View the report one page at-a-time

	Shift+F3	Continuous: View the report with all pages displayed continuously
	Shift+F4	Multiple Pages: based on the selected zoom, all possible pages are displayed to fill the viewer window
	No keystroke	Selected Zoom: View the report at the percent size specified

Saving Reports

In order to facilitate the utilization of the information included in the CDA Validation Report, CDA Validation Plus offers an extensive number of file formats in which the reports can be saved. You can save the reports in different file formats in order to further analyze or format the data included differently, or you can save the report as an image file to be placed in documents and presentations.

You can save the report in any of the file formats listed under the Save As icon on the Main Toolbar of the Report Viewer:



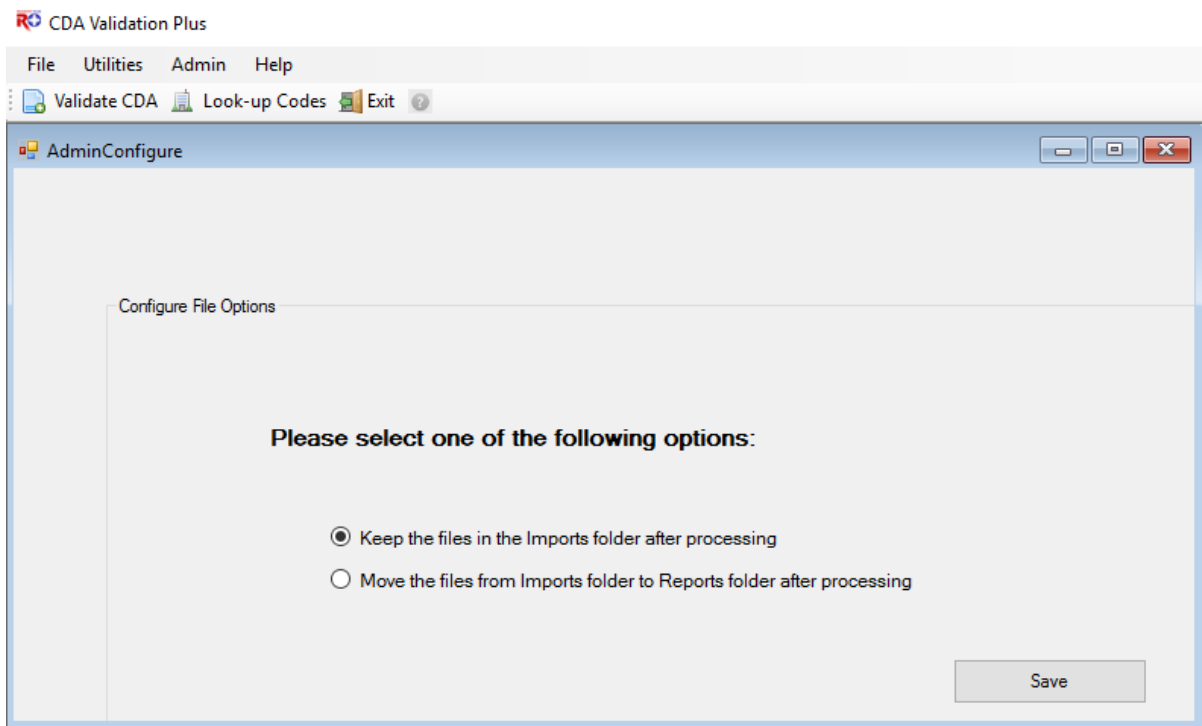
Document Copying and Auto-generating Excel Validation Report upon Validation

When a CDA document or documents are validated using CDA Validation Plus, there will be 1 of 3 outcomes:

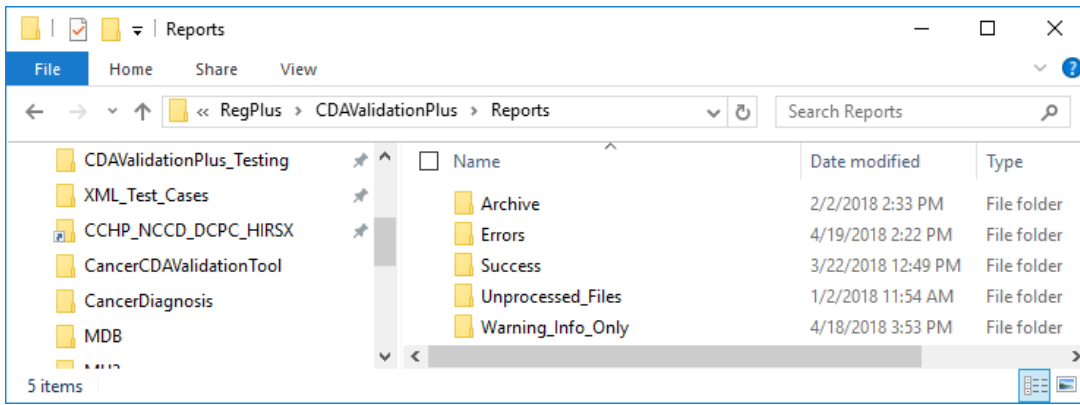
1. The CDA document(s) contains errors
2. The CDA document(s) is valid and contains no validation errors
3. The CDA document(s) cannot be read by CDA Validation Plus due to major issues with overall document format

In order to facilitate the tracking of validation efforts, based on the validation results CDA Validation Plus automatically generates a copy of the validated documents and places an Excel-formatted and XML copies of the Validation Report to one of **4 subfolders** in the **C:\RegPlus\CDAValidationPlus\Reports** folder, which are named **Errors**, **Success**, **Warning_Info_Only** and **Unprocessed_Files**. All the processed documents (except for the 2 sample documents provided by the Validation tool and unprocessed documents) are copied from the original folder to the respective Reports folders (errors or success) after validation. For unprocessed documents a copy of the document is placed in the Unprocessed_Files folder.

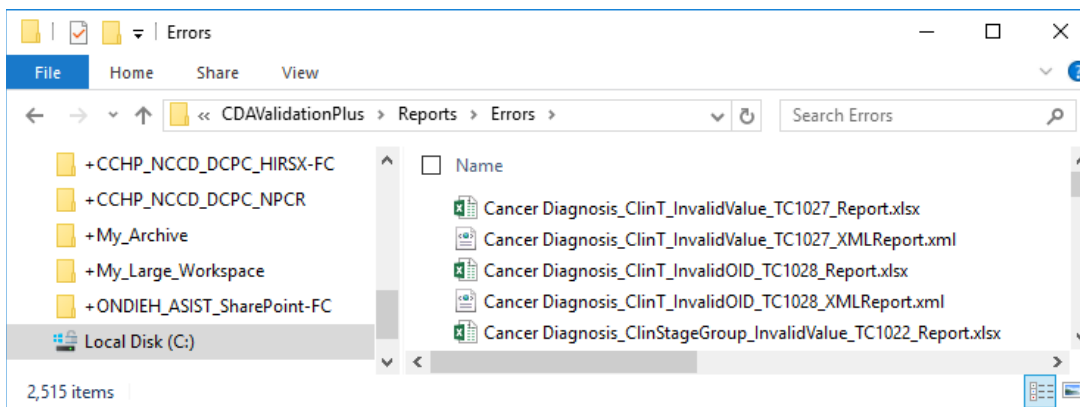
CDA Validation Plus has a default configuration to “keep” the files in the imports folder after processing. If you would like to change the configuration to move the files from the imports folder to the reports folder after processing, you’ll need to update the Configure File Options under **Admin**.



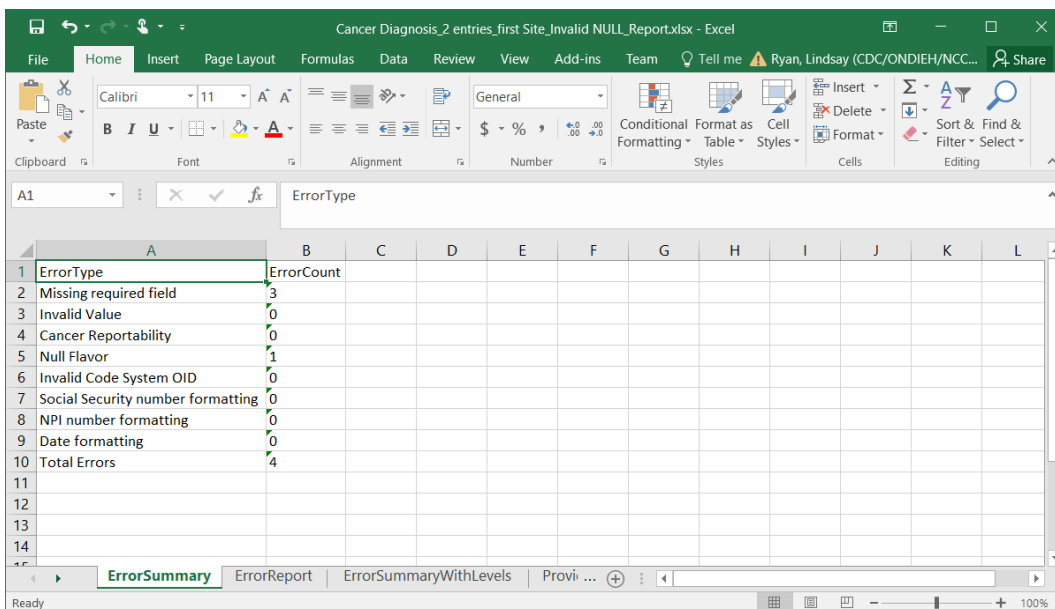
The **two sample CDA documents included with the application** are **NOT** moved from the IMPORTS folder, enabling you to validate the sample documents as often as you wish.



If the CDA document contains any validation errors, a copy of the document and the Excel-formatted report will be generated. Both will be placed in the <code>C:\RegPlus\CDAValidationPlus\Reports\Errors</code> folder:



The Excel-formatted Validation Report generated for documents containing validation errors includes 4 worksheets, **ErrorSummary**, **ErrorReport**, **ErrorSummaryWithLevels** and **ProviderNameAndNPI**. The Error Summary worksheet refers to the Validation Report Error Summary information:



The Error Report worksheet refers to the Validation Report Error Section information:

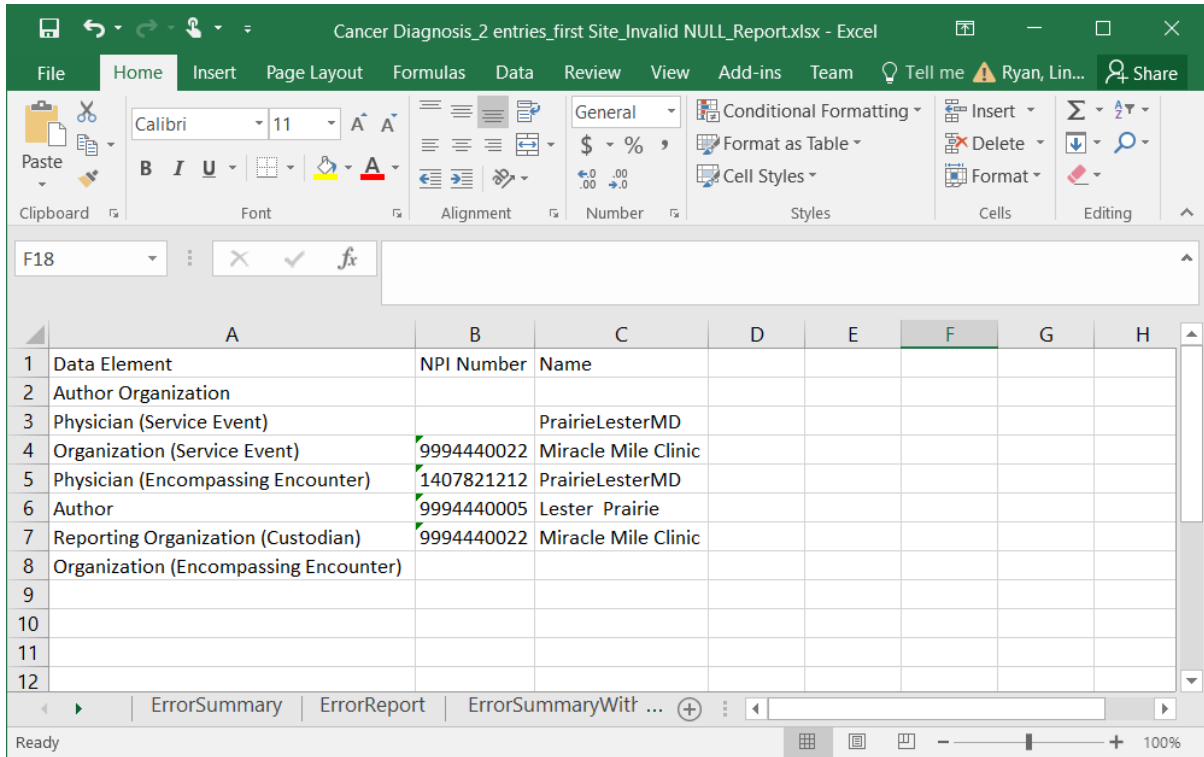
	A	B	C	D
1	Error Type	Data Element	Error Message	XPath
2	Missing required field	Patient's Last Name	Critical Field: Patient's Last Name is not present or is structurally incorrect	ClinicalDocument/recordTarget/patientRole/patient/name/family[not(@qualifier='BR')]
3	Null Flavor	Active Problem Code	A null flavor is not expected for the required data element Active Problem Code	ClinicalDocument/component/structuredBody/component/section[urn:templateId[@root='1.3.6.1.4.1.19376.1.5.3.1.3.6']]/entry/act/entryRelationship/observation[urn:templateId[@root='1.3.6.1.4.1.19376.1.5.3.1.4.5'] and not (urn:templateId[@root='1.3.6.1.4.1.19376.1.7.3.1.4.14.1'])/value/@code
4	Invalid Code System OID	Histology Code System O	The Code System OID 2.16.840.1.113883.6.43.5 for Histology Code System OID is not valid. Valid Code System OIDs for this field are 2.16.840.1.113883.6.43.1, 2.16.840.1.113883.6.103, 2.16.840.1.113883.6.96	ClinicalDocument/component/structuredBody/component/section[urn:templateId[@root='1.3.6.1.4.1.19376.1.5.3.1.3.6']]/entry/act/entryRelationship/observation[urn:templateId[@root='1.3.6.1.4.1.19376.1.7.3.1.4.14.1']]/value/@codeSystem
5	Cancer Reportability	Primary Site Code	Cancer diagnosis entry may not represent a reportable cancer. Manual review to determine reportability is recommended.	ClinicalDocument/component/structuredBody/component/section[urn:templateId[@root='1.3.6.1.4.1.19376.1.5.3.1.3.6']]/entry/act/entryRelationship/observation[urn:templateId[@root='1.3.6.1.4.1.19376.1.7.3.1.4.14.1']]/targetSiteCode/@code

The Error Summary with Levels worksheet refers to the total error count with error levels.

	A	B	C	D	E	F	G	H	I
1	Error Type	Total Errors	Critical	Error	Warning	Info			
2	Missing required field	7	0	7	0	0			
3	Date formatting	2	0	2	0	0			
4	Invalid Code System OID	3	0	3	0	0			



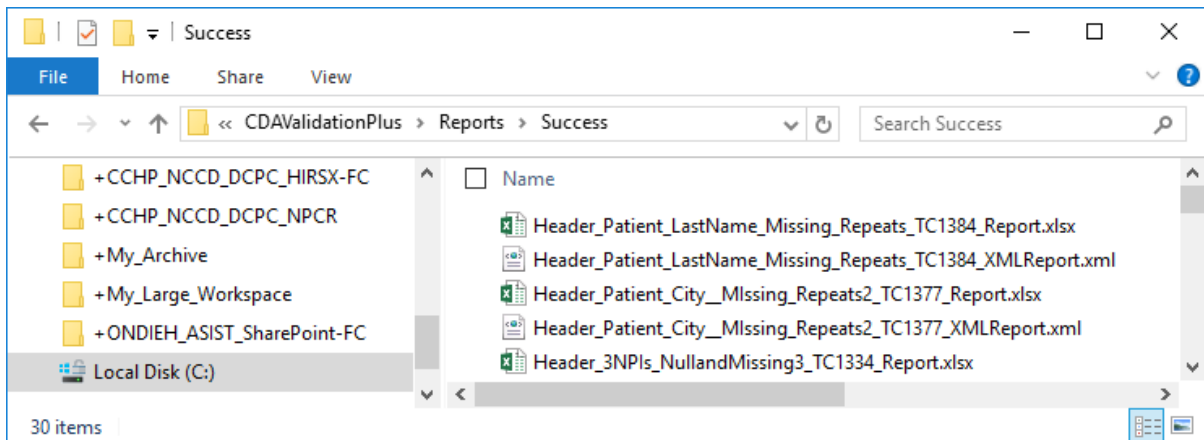
The Provider Name and NPI worksheet displays the Author, Physician and Organization with NPI and Name.



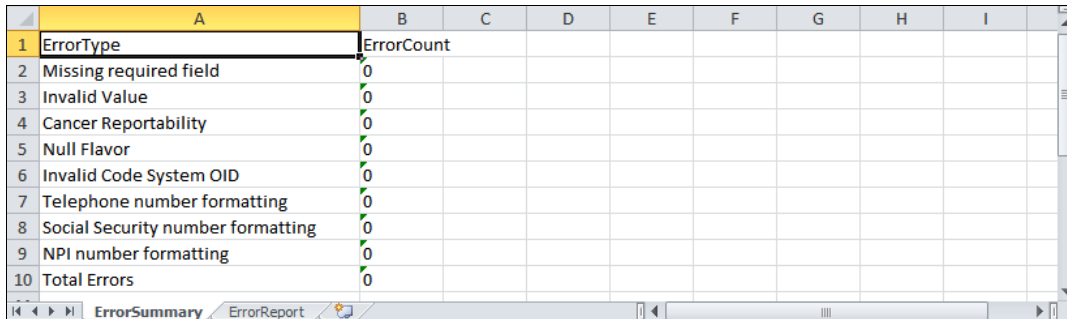
Tip

As mentioned earlier, registries may want to take advantage of the Excel-based Validation Report, formatting the report to make it more visually appealing and clarifying its contents, and adding an additional column as to whether the identified error is required by the registry to be fixed and forwarding to the submitting vendor/organization.

If the CDA document is 100% valid and does not contain any validation errors, a copy of the document and the Excel-formatted report will be generated. Both will be placed in the C:\RegPlus\CDAValidationPlus\Reports\Success folder:



For the Excel-formatted Validation Report generated for documents containing no validation errors, the Error Summary worksheet will indicate that zero validation errors were identified, and the Error Report worksheet will display an empty report:



1	ErrorType	ErrorCount							
2	Missing required field	0							
3	Invalid Value	0							
4	Cancer Reportability	0							
5	Null Flavor	0							
6	Invalid Code System OID	0							
7	Telephone number formatting	0							
8	Social Security number formatting	0							
9	NPI number formatting	0							
10	Total Errors	0							

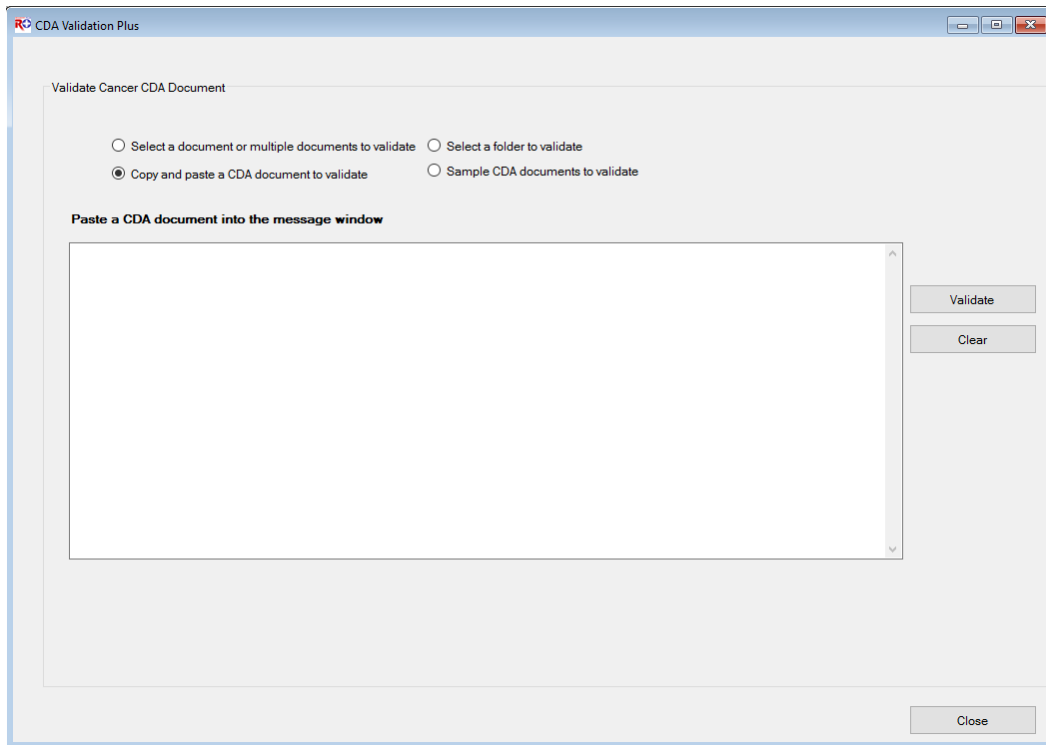
If the document has formatting issues that prevent it from being read by CDA Validation Plus (e.g., not a valid XML file), the document will not be processed, and a copy of the document will be generated and placed in the C:\RegPlus\CDAValidationPlus\Reports**Unprocessed_Files** folder.

Using the Copy and Paste a Document to Validate Option

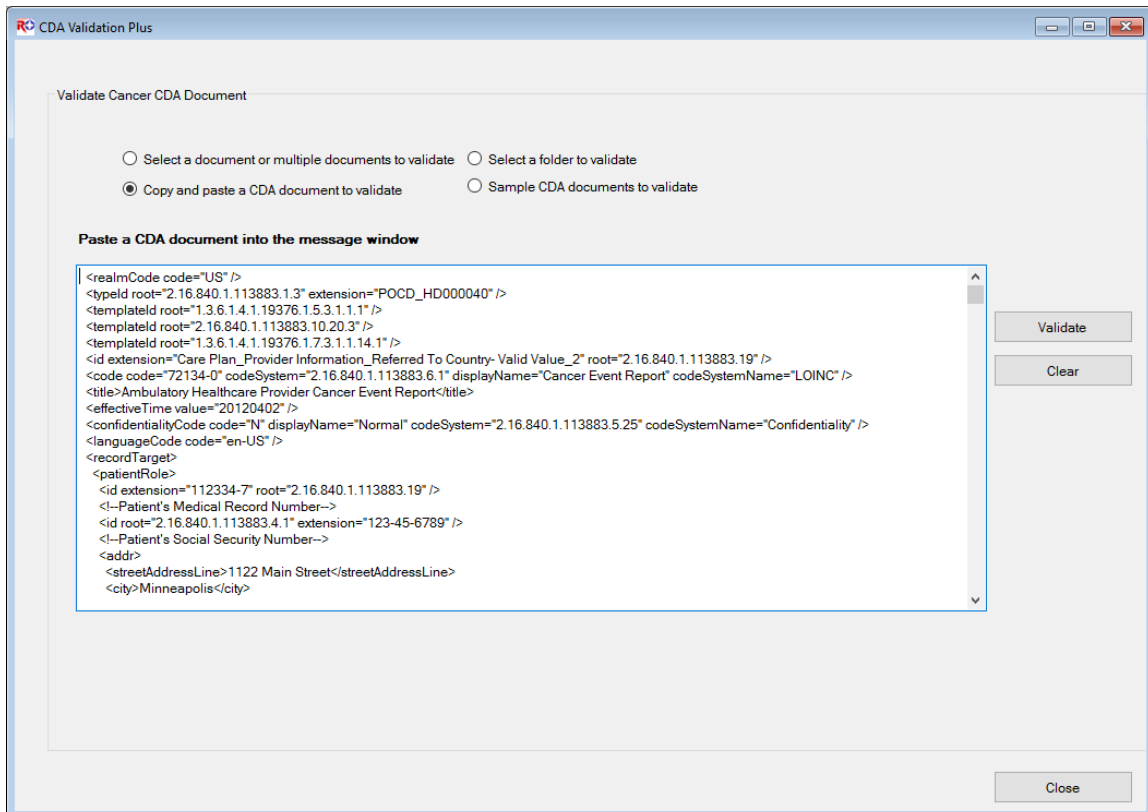
In addition to being able to upload a test document(s) produced by EMR/EHR vendor software, or to upload documents submitted to a cancer registry from their EMR/EHR software vendors, CDA Validation Plus allows you to manually copy and paste a CDA document into the application document window for validation.

To copy and paste a CDA document for validation, complete these steps;

1. On the **Validate Cancer CDA Document** window click **Copy and paste document to validate**.



2. Place your cursor into the document window, and **paste** the CDA document you would like to validate.



3. Click **Validate**.

Result: The **CDA Document Validation Report** opens in the CDA Validation Plus **Report Viewer**, where information on identified validation errors is displayed.

Once you have the Validation Report open in the report viewer window, the application works in the same exact manner as for an uploaded document. Please click [here](#) or go to page 29 of this user guide to review the various features of the Validation Report.



Tip

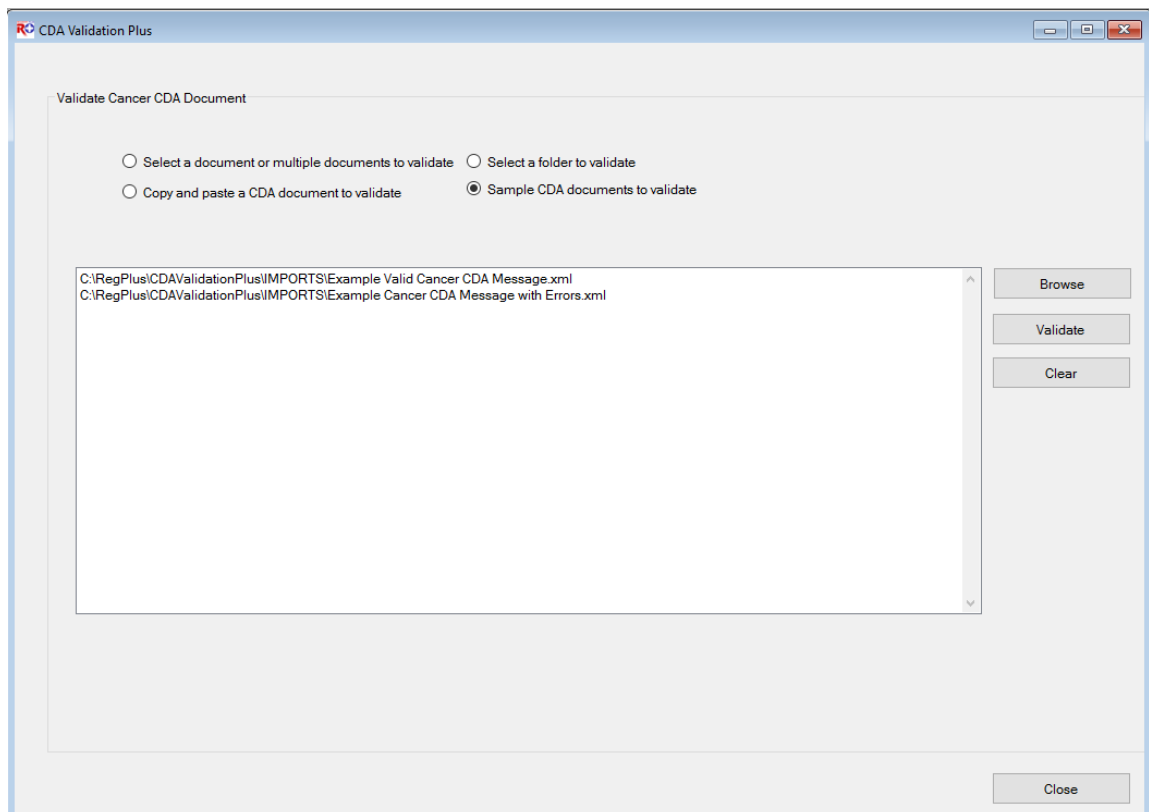
If you use the Copy and paste document to validate option, it is best to open the CDA document in a plain text or XML editor in order to copy/paste. Opening CDA documents in other programs such as a web browser sometimes results in introduction of invalid characters that will result in an “invalid XML” error.

Using the Sample Document to Validate Option

CDA Validation Plus comes with four sample documents that you can validate in order to familiarize yourself with the program, two that include some validation errors for MU2 and MU3, and two that are valid (no errors) for MU2 and MU3. The four documents are located in the C:\RegPlus\CDAValidationPlus\IMPORTS folder, and are named **Example MU2 Cancer CDA Message with Errors.xml**, **Example MU2 Valid Cancer CDA Message.xml**, **Example MU3 Cancer CDA Message with Errors.xml**, **Example MU3 Valid Cancer CDA Message.xml**

To upload a sample CDA document provided with the application, complete these steps;

1. On the **Validate Cancer CDA Document** window click the **Sample documents to validate** option button.

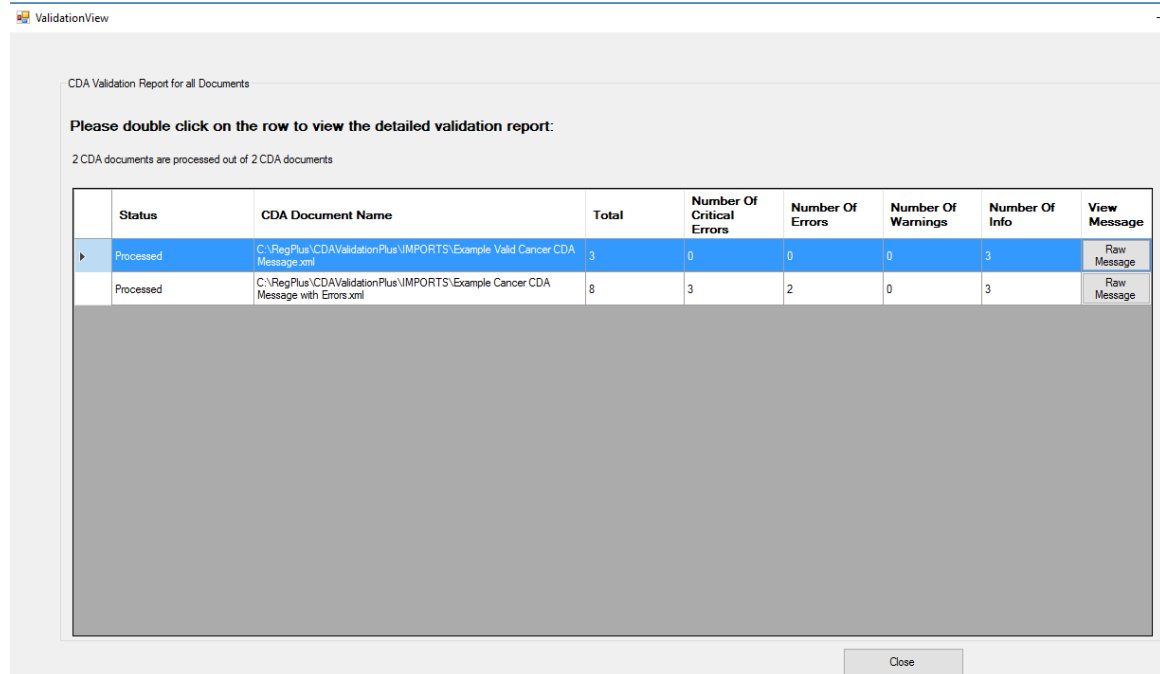


Result: The name and path of the four sample documents that come included in the program are automatically selected and displayed by the application (**Example MU2**

Cancer CDA Message with Errors.xml, Example MU2 Valid Cancer CDA Message.xml, Example MU3 Cancer CDA Message with Errors.xml, Example MU3 Valid Cancer CDA Message.xml).

2. Click **Validate**.

Result: The **ValidationView** window opens and displays a list of the validation reports that were generated, along with some helpful information like the document Status (Processed or Unprocessed), the path and filenames of the documents that were validated, as well as the number of validation errors identified (if any).



The screenshot shows the ValidationView window with the following table:

Status	CDA Document Name	Total	Number Of Critical Errors	Number Of Errors	Number Of Warnings	Number Of Info	View Message
Processed	C:\RegPlus\CDAValidationPlus\IMPORTS\Example Valid Cancer CDA Message.xml	3	0	0	0	3	Raw Message
Processed	C:\RegPlus\CDAValidationPlus\IMPORTS\Example Cancer CDA Message with Errors.xml	8	3	2	0	3	Raw Message

Below the table is a large greyed-out area and a 'Close' button at the bottom right.

Result: The CDA **ValidationView** window opens where information on identified validation errors is displayed in the validation results grid.

Once you have the ValidationView window open for the sample CDA documents, the application works in the same exact manner as for an uploaded document. Please click [here](#) or go to page 25 of this user guide to review the various features of the View Message features and Validation Report.



Note

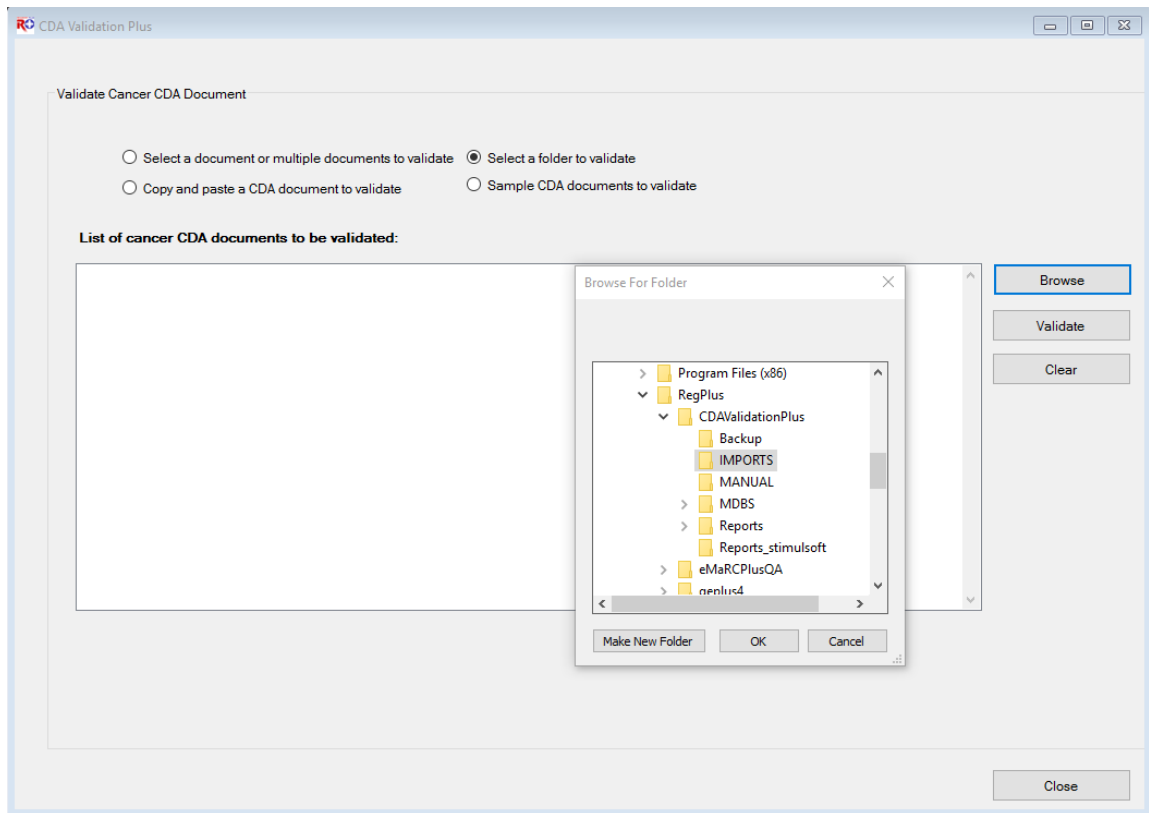
The **two sample CDA documents included with the application** are **NOT copied** from the IMPORTS folder, enabling you to validate the sample documents as often as you wish.

Using the Select Folder to Validate Option

In order to enable batch processing of a large number of documents, CDA Validation Plus offers the option to browse to a folder that contains all of the CDA documents you would like to validate, and upload all documents in the specified folder into the application for validation.

To upload all CDA documents in a user-specified folder, complete these steps:

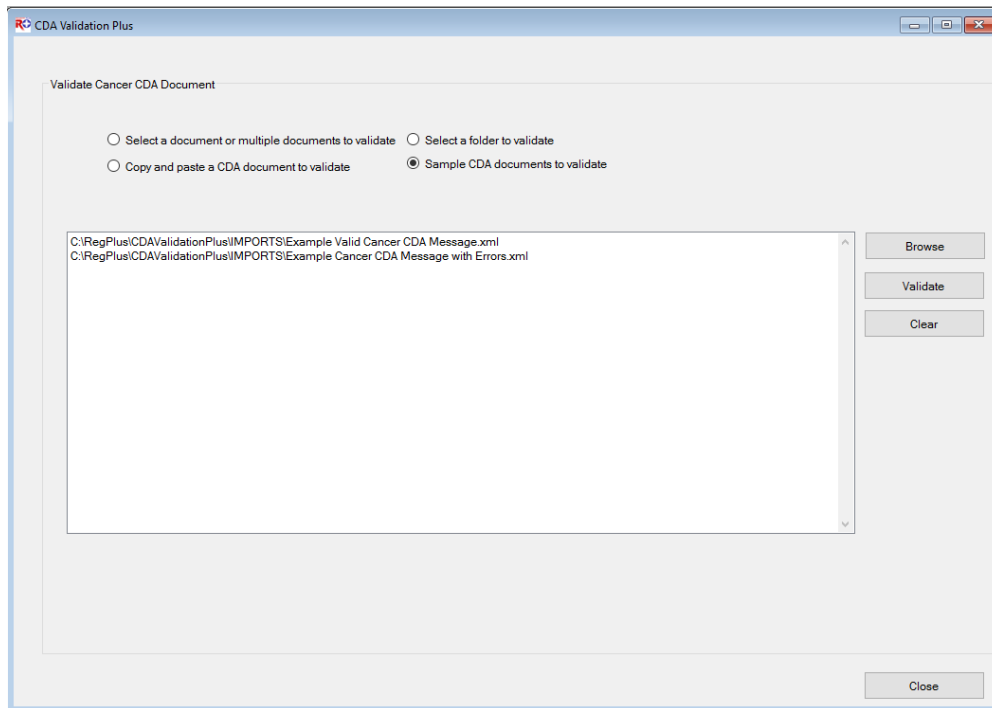
1. On the **Validate Cancer CDA Document** window click the **Select a folder to validate** option button.
2. Click **Browse**.



Result: The **Browse for Folder** window opens (defaulted to the **C:\RegPlus\CDAValidationPlus\IMPORTS** folder. You can **browse to the folder** in which the all of CDA documents you would like to validate are located.

3. **Select** the appropriate folder and click **OK**.

Result: You are returned to the **Validate Cancer CDA Document** window, where the name and path of all of the CDA documents in the specified folder are displayed.



4. Click **Validate**.

Result: The **Validation View** window opens and displays a list of the validation reports that were generated, along with some helpful information like the document Status (Processed or Unprocessed), the path and filenames of the documents that were validated, as well as the number of validation errors identified (if any).

Once you have the ValidationView window open for the CDA documents located in the folder selected to validate, the application works in the same exact manner as for an uploaded document. Please click [here](#) or go to page 25 of this user guide to review the various features of the View Message features and Validation Report.

Running CDA Validation Plus from the DOS Command Line

To enable interaction with other programs, the DOS command line interface can be used to run CDA Validation Plus to validate CDA documents. Once the appropriate DOS command has been executed, the processing of the documents is similar to that when using the Select Folder to Validate Option or Select a Document Option. In order to validate CDA documents using the DOS command line, all the CDA documents to be validated should be located in a single folder.

To use the DOS command line prompt to validate CDA documents, complete these steps:

1. Open the DOS command prompt window.
 - a. **On Windows XP:**
 - i. Click on **Start** then select **Run**.
 - ii. Type **cmd** in **Open** box and press **Enter**.
 - b. **On Windows Vista/ Windows 7/ Windows 8.0/Windows server:**
 - i. Type **cmd** in the **Start---> Run** box.

- ii. Press the keystrokes **Ctrl+Shift+Enter** (this will open the command prompt in Administrator mode).
2. At the command prompt, type **cd** and **press Enter** to go to the root directory (i.e., C:\)
3. Type **cd RegPlus\CDAValidationPlus** and press **Enter**.
4. **Import from a folder or import a single file:**

- a. Importing from a folder:**

Type the **following command** and press **Enter**.

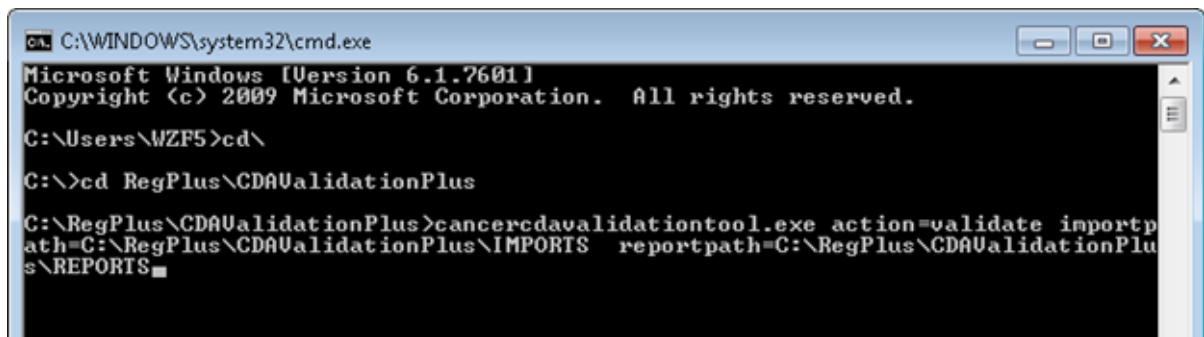
```
>cancercdavalidationtool.exe action=validate importpath=XX reportpath=YY
```

Where XX=the path to the folder where the CDA documents are located, and YY=the path to the folder to which you would like the application to copy the validated documents and the generated Excel-formatted Validation Reports. Please note that the above exact syntax must be used, including spaces where designated.

Example:

```
cancercdavalidationtool.exe action=validate  
importpath=C:\RegPlus\CDAValidationPlus\IMPORTS  
reportpath=C:\RegPlus\CDAValidationPlus\REPORTS
```

Please see the above example in the DOS command window:



```
C:\WINDOWS\system32\cmd.exe  
Microsoft Windows [Version 6.1.7601]  
Copyright (c) 2009 Microsoft Corporation. All rights reserved.  
C:\Users\WZF5>cd\  
C:\>cd RegPlus\CDAValidationPlus  
C:\RegPlus\CDAValidationPlus>cancercdavalidationtool.exe action=validate importpath=C:\RegPlus\CDAValidationPlus\IMPORTS reportpath=C:\RegPlus\CDAValidationPlus\REPORTS
```

- b. Importing a single file:**

To specify a file instead of a folder for processing, you would type the following command and press ENTER.

Type the **following command** and press **Enter**.

```
>cancercdavalidationtool.exe action=validate importpath=ZZ reportpath=YY
```

Where ZZ=the path including file name where the CDA document is located, and YY=the path to the folder to which you would like the application to copy the validated documents and the generated Excel-formatted Validation Reports. Please note that the above exact syntax must be used, including spaces where designated.

```
C:\RegPlus\CDAValidationPlus>cancercdavalidationtool.exe action=validate  
importpath=C:\RegPlus\CDAValidationPlus\IMPORTS\NameOfFile.xml  
reportpath=C:\RegPlus\CDAValidationPlus\REPORTS
```

Note: The file name cannot have spaces due to DOS file name restrictions.

After the validation process has run, CDA Validation Plus copies the CDA documents that were run through the application and, for valid and errant documents, generates and Excel-formatted copy of each Validation Report and places them in the appropriate sub-folder in the C:\RegPlus\CDAValidationPlus\Reports folder. Please see [Document Copying and Auto-generating Excel Validation Report upon Validation](#) on page 35 of this guide for further information regarding this process.

Chapter 3: CDA Validation Plus Application Folders

Learning Objectives

In this chapter, you will:

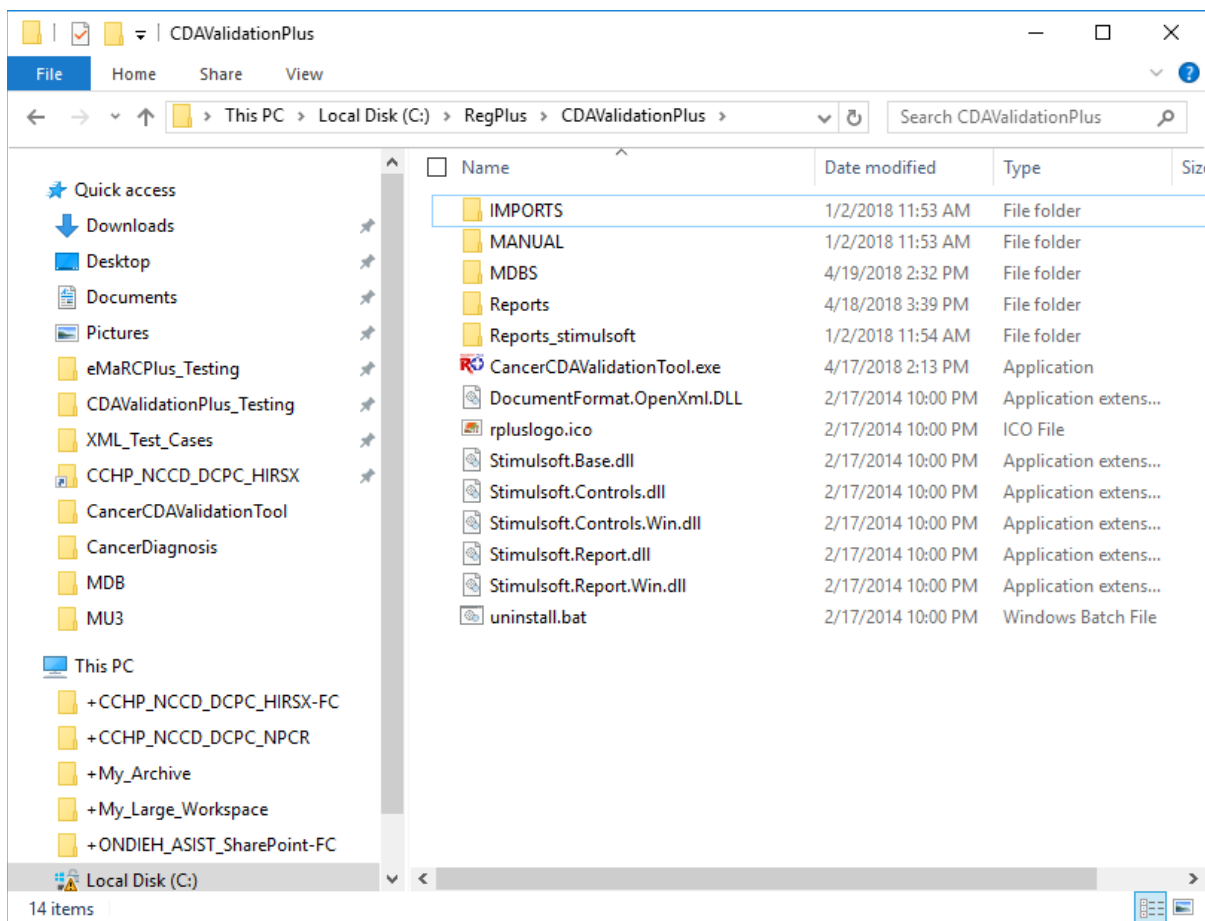
- Learn about the location and content of the various CDA Validation Plus application folders

Overview

This chapter describes the application folders that are generated upon installation of CDA Validation Plus.

CDA Validation Plus Set up

Upon installation, the default folder in which CDA Validation Plus is installed is the **C:\RegPlus\CDAValidationPlus** folder.



In addition to the application's .exe file, the main application folder includes the following sub-folders:

Sub-folder	Description of Contents
IMPORTS	<p>The IMPORTS folder is the default location of CDA documents to be imported into the program:</p> <ul style="list-style-type: none"> – When you select the Upload a document to validate option on the CDA Validation window, the application opens to the IMPORTS folder by default – This is also where the sample CDA documents are located; when you select the Sample document to validate option on the CDA Validation window, the application automatically uploads the two sample documents in the IMPORTS folder
MANUAL	<p>This user guide is included with CDA Validation Plus; upon installation of the application this guide, CDA_Validation_Plus_V4_0_User Guide.pdf, is placed in the MANUAL folder</p>
MDBS	<p>CDA Validation Plus uses a Microsoft Access database (Cancer_Validation.mdb) to ascertain the type of validation rule to apply to each data element validated in the CDA document; in addition the database also includes information on the Xpaths used to parse out the data elements from the CDA document</p>
REPORTS	<p>This sub-folder serves as the default location in which to save generated Validation Reports; based on the CDA document validation results CDA Validation Plus automatically copies the validated documents and generates an Excel-formatted copy of the Validation Report to the appropriate subfolders in the C:\RegPlus\CDAValidationPlus\Reports folder, which are named Errors, Warning_Info_Only, Success, and Unprocessed_Files.</p>

Chapter 4: CDA Validation Plus Database Structure

Learning Objectives

In this chapter, you will:

- Learn about the structure and content of the CDA Validation Plus Access database

Overview

This chapter describes the structure and content of the **Cancer_Validation.mdb** Access database against which CDA Validation Plus runs.

The CDA Validation Plus Access Database

CDA Validation Plus runs against a Microsoft Access database to identify the types of validation rules to apply to the various data elements being validated. The application also uses Xpath as the basis for parsing the data elements from the CDA document in order to validate them. The main table in the database referenced when validating CDA documents presented to the application are the **CDAMAP_MU2** and **CDAMAP_MU3** tables.

Field Name	Data Type
ID	AutoNumber
XPATH	Long Text
LABEL	Short Text
LABELFORVALIDATION	Short Text
SECTIONNAME	Short Text
SORT_ORDER	Number
VALIDVALUES	Short Text
ERRORMESSAGE	Long Text
ERRORTYPE	Short Text
ERRORLEVEL	Short Text
VALUESETOID	Short Text

The Xpaths for the data elements can be found in the CDAMAP tables in the database in the “XPATH” column. The name of the data element being validated can be found in the “LABEL” and/or “LABELFORVALIDATION” columns. The “VALIDVALUES” column identifies the valid code system OIDs for coded elements and the table name that identifies the valid values for each valid code system OID identified. The OID is listed first, then a pipe (“|”) delimiter, followed by the corresponding table name. If more than one valid OID is allowed, the OID|table name pairs are separated by a semi-colon.

The validation tables identified in the “VALIDVALUES” column can also be viewed in the database and are all named beginning with a prefix of either Valid_ or Trans_. Each validation table includes an HL7CODE column (valid codes) and Concept Name column.

HL7CODE	Concept Name	Code System OID
0	Benign	2.16.840.1.113883.3.520.3.14
1	Uncertain whether benign or malignant	2.16.840.1.113883.3.520.3.14
2	Carcinoma in situ	2.16.840.1.113883.3.520.3.14
3	Malignant, primary site	2.16.840.1.113883.3.520.3.14
6	Malignant, metastatic site	2.16.840.1.113883.3.520.3.14
9	Malignant, uncertain whether primary or metastatic site	2.16.840.1.113883.3.520.3.14
*		

The “ERRORMESSAGE” column in the CDAMAP tables indicates the error message(s) that will appear in the validation report. Where more than one validation rule type is applied to the same data element, the error messages are separated by pipe delimiters. The “ERRORTYPE” column indicates the validation rule type(s) that are applied to the data element. Where more than one validation rule type is applied to the same data element, the error types are separated by pipe delimiters. The “ERRORLEVEL” column indicates the level of error (Critical, Error, Warning or Info) for the data element and validation rule type. Where more than one validation rule type is applied to the same data element, the error types are separated by pipe delimiters.

Resolving Identified Errors

With the detailed information included in the Validation Report, error messages, Xpaths, and Access database, EMR/EHR vendors should be able to determine the cause for any identified errors in the CDA documents that their products generate. To obtain answers to questions regarding error resolution, contact cancerinformatics@cdc.gov for technical assistance.



DO NOT make **ANY CHANGES** to the content of the CDAMAP tables or any of the validation tables, as this may lead to interference in correction of identified data problems and/or erroneous identification of errors where the data are actually valid. Communicate any identified revisions to CDC immediately and we will address them in-house. CDC will not support any user changes to the tables with upgrades, as with every new release of the software the CDAMAP table will be overwritten with the latest version.

Chapter 5: Software Updates

Learning Objectives

In this chapter, you will:

- Learn about how to assess if you have the latest version of CDA Validation Plus
- Learn how to obtain the latest version of CDA Validation Plus

Overview

This chapter covers information about keeping your CDA Validation Plus software up-to-date.

Software Updates

CDA Validation Plus will be continually refined and enhanced based on newly released versions of MU Guidelines and HL7 CDA, as well as functionality needs of, and feedback from, end users. CDC NPCR welcomes feedback from all users of the program. Existing validation rules will be enhanced and new rules will be added as feedback is received. As a result, you will want to ensure that you keep the software current on your computer or network.

New versions of the software will be released frequently, and will be announced to all registered users of the software via e-mail.

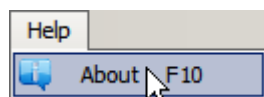
If you would like to become a registered user of the software and receive download and software update information for CDA Validation Plus, please email a request to Lindsay Ryan at viu3@cdc.gov with the following information:

- Name, email address, and phone number of Organization/Vendor/State/Program making the request (e.g. NYSCR, Epic)
- If an EHR vendor, provide the name of your physician EHR software that will be transmitting cancer reports
- Name, email address, and phone number of person installing/using the tool

In order to make sure you have the most up-to-date version of the software, check the software version number and release date in the update e-mail received and compare that to the software version and the release date of your currently installed version of the software.

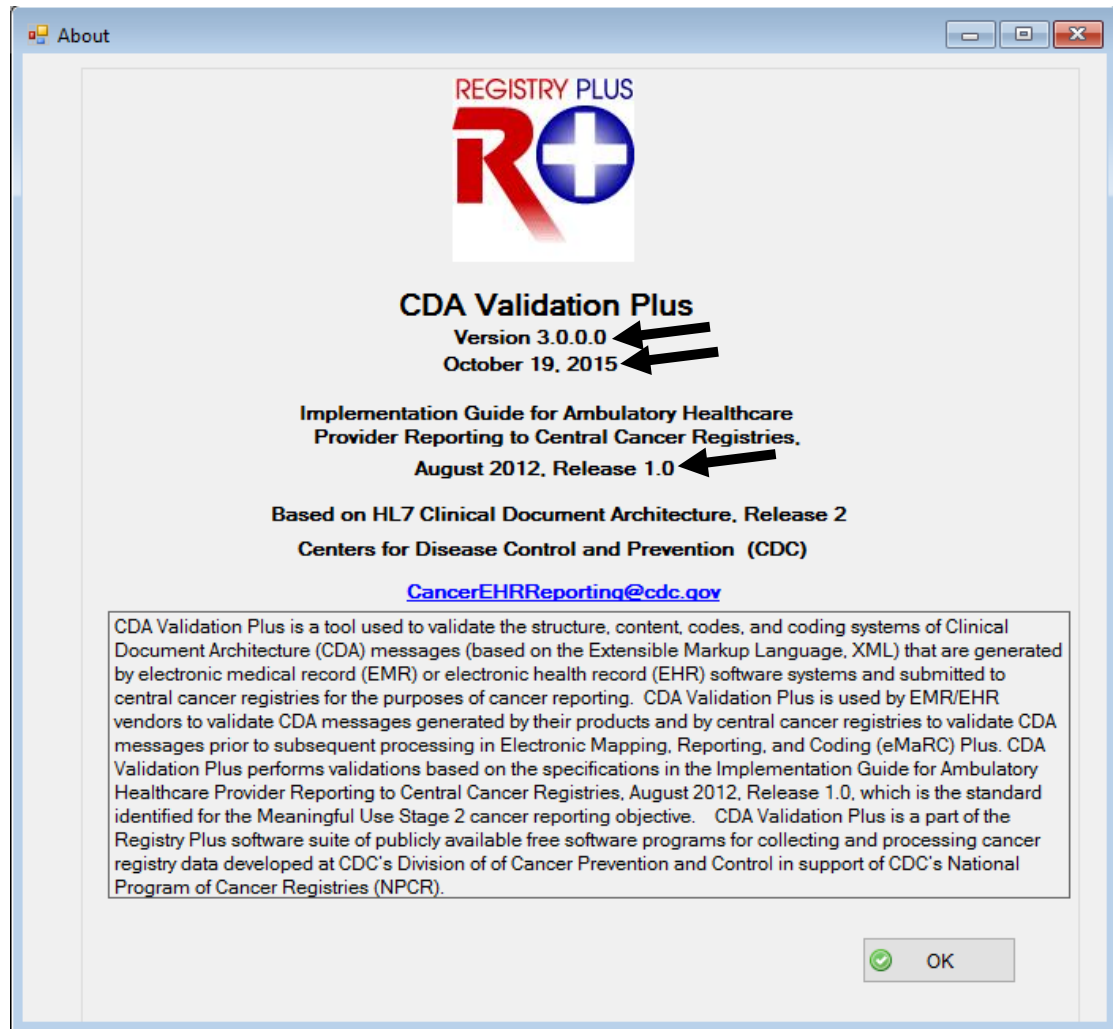
To check for the version of CDA Validation Plus that you currently have installed on your computer, complete these steps:

1. Open the About window. This can be done in two ways:
 - a. From **Help** Menu, select **About**.



- b. Use the keystroke **F10**.

Result: The **About** window opens.



The About window lists CDA Validation Plus, Cancer IG, and CDA versioning information, as well as contact information for questions about the software.

2. Note the CDA Validation Plus Version and release date, and double-check this with the latest version available on the FTP site.
3. If your currently installed version is out of date, please contact Lindsay Ryan at viu3@cdc.gov to obtain the latest version of the software.
4. If you have a previously installed version of the program, you must first uninstall that version and then install the latest version. Please note that uninstalling the previous version will not delete any reports already generated.

Appendix A: Standard Keyboard Shortcuts

Menus and Sub-options	Keyboard Combination
File Menu	Alt+ F
Validate CDA Document	Ctrl+ M
Exit	Alt+F4
Utilities Menu	Alt+ U
Look-up code Definitions...	Ctrl+L
Help Menu	Alt+ H
About	F10

Appendix B: Data Elements/OIDs Checked

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
Critical Missing Required Field	Date/Time of Report Patient's First Name Patient's Last Name Patient's Gender Code Patient's Date of Birth Diagnosis Date Histology Code Behavior Code Laterality Code Primary Site Code Histology Code System OID Behavior Code System OID Laterality Code System OID Primary Site Code System OID	Date/Time of Report Patient's First Name Patient's Last Name Patient's Gender Code Patient's Date of Birth Diagnosis Date Histology Code Behavior Code Laterality Code Primary Site Code

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
Missing Required Field	Patient's Middle Name Patient's Street Address Patient's City Patient's State Patient's Zip code Patient's Country Patient's Address Start Date Patient's Address End Date Patient's Phone Number Patient's Social Security Number Patient's Medical Record Number Patient's State of Birth Patient's Country of Birth Patient's Race Code Patient's Ethnicity Code Patient's Marital Status Code Author First Name Author Last Name Author Name Author Street Address Author City Author State Author Zip Code Author Telephone # Reporting Organization Name (Custodian) Reporting Organization Street Address (Custodian) Reporting Organization City (Custodian) Reporting Organization State (Custodian) Reporting Organization NPI (Custodian) Reporting Organization Zip Code (Custodian) Reporting Organization Telephone # (Custodian) Occupation Code Industry Code Smoking Status Code Diagnostic Confirmation Code Active Problem Code Active Problem Start Date	Patient's Middle Name Patient's Street Address Patient's City Patient's State Patient's Zip code Patient's Country Patient's Phone Number Patient's Address Start Date Patient's Address End Date Patient's Medical Record Number Patient's Social Security Number Patient's State of Birth Patient Country of Birth Patient's Marital Status Code Patient's Race Code Patient's Additional Race Code Patient's Ethnicity Code Author Name Author First Name Author Last Name Author Street Address Author City Author Zip Code Author Telephone # Author State Author Country Smoking Status Code Reporting Organization NPI (Custodian) Reporting Organization Name (Custodian) Reporting Organization Street Address (Custodian) Reporting Organization City (Custodian) Reporting Organization Telephone # (Custodian) Type of Primary Payer at Diagnosis Code Assessment Narrative Occupation Code Industry Code Diagnostic Confirmation

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	Progress Notes (text) Radiation Oncology Narrative TNM Clinical T Code TNM Clinical N Code TNM Clinical M Code TNM Clinical Stage Group Code	Code Problem Code Procedure Code Medication Product Code Medication Start Date Medication Administered Product Code Medication Administered Start Date Problem Start Date Procedure Start Date TNM Pathologic T Code TNM Pathologic N Code TNM Pathologic M Code TNM Clinical T Code TNM Clinical N Code TNM Clinical M Code TNM Clinical Stage Group Code Grade Code TNM Pathologic Stage Group Code Procedure Reason ID Medication Administered Reason ID Cancer Diagnosis Link to Problem ID Document Version Number Medication Reason ID Set ID Software Name

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
Invalid/unexpected Null Flavor	Date/Time of Report Patient's First Name Patient's Last Name Patient's Street Address Patient's Zip code Patient's Gender Code Patient's Date of Birth Patient's Medical Record Number Patient's Race Code Patient's Ethnicity Code Reporting Organization NPI (Custodian) Diagnosis Date Histology Code Behavior Code Diagnostic Confirmation Code Primary Site Code Laterality Code Active Problem Code	Patient's First Name Patient's Last Name Patient's Street Address Patient's City Patient's State Patient's Zip code Patient's Country Patient's Phone Number Patient's Gender Code Patient's Date of Birth Patient's Medical Record Number Patient's Race Code Patient's Ethnicity Code Patient's Additional Race Code Patient's Social Security Number Patient's State of Birth Patient Country of Birth Patient's Marital Status Code Author Name Author First Name Author Last Name Reporting Organization Telephone # (Custodian) Reporting Organization Name (Custodian) Occupation Code Industry Code Diagnosis Date Primary Site Code Laterality Code Histology Code Behavior Code Diagnostic Confirmation Code Problem Code Procedure Code Grade Code Medication Product Code Medication Administered Product Code Problem Start Date Procedure Start Date Problem ID

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
		Procedure Reason ID Medication Administered Reason ID Cancer Diagnosis Link to Problem ID Medication Reason ID Date/Time of Report Document Version Number Set ID Software Name
Invalid Code System OID	Patient's Gender Code System OID Patient's Race Code System OID Patient's Additional Race Code System OID Patient's Ethnicity Code System OID Patient's Marital Status Code System OID Occupation Code System OID Industry Code System OID Smoking Status Code System OID Type of Primary Payer at Diagnosis Code System OID Histology Code System OID Behavior Code System OID Diagnostic Confirmation Code System OID Primary Site Code System OID Laterality Code System OID TNM Clinical Stage Group Code System OID TNM Clinical Stage Descriptor Code System OID TNM Edition Code System OID TNM Clinical Staged By Code System OID TNM Clinical T Code System OID TNM Clinical N Code System	Patient's Gender Code System OID Patient's Race Code System OID Patient's Additional Race Code System OID Patient's Ethnicity Code System OID Patient's Marital Status Code System OID Physician Specialty (Service Event) Code System OID Physician Specialty Code System OID (Encompassing Encounter) Occupation Code System OID Industry Code System OID Smoking Status Code System OID Type of Primary Payer at Patient's Gender Code System OID Patient's Race Code System OID Patient's Ethnicity Code System OID Patient's Additional Race Code System OID Histology Code System OID Behavior Code System OID Diagnostic Confirmation Code System OID

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	OID TNM Clinical M Code System OID Active Problem Code System OID Procedure Code System OID (Related to Results) Procedure Code System OID Site of Procedure Code System OID Medication Product Code System OID Medication Administered Product Code System OID	Primary Site Code System OID Laterality Code System OID TNM Clinical Stage Group Code System OID TNM Clinical Stage Descriptor Code System OID TNM Clinical Staged By Code System OID TNM Pathologic Staged By Code System OID TNM Pathologic T Code System OID TNM Pathologic N Code System OID TNM Pathologic M Code System OID TNM Pathologic Stage Group Code System OID TNM Pathologic Stage Descriptor Code System OID TNM Clinical T Code System OID TNM Clinical N Code System OID TNM Clinical M Code System OID Procedure Code System OID Site of Procedure Code System OID Medication Product Code System OID Medication Administered Product Code System OID Occupation Code System OID Industry Code System OID Author Specialty Code System OID Problem Code System OID Smoking Status Code System OID Grade Code System OID Radiation Regional Treatment Modality Code System OID Radiation Boost Modality

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
		Code System OID System OID Family Member Code System OID Family Member Problem Code System OID Health Status Code System OID Vital Sign Type Code System OID
Invalid Value	Patient's City Patient's State Patient's Country Patient's State of Birth Patient's Country of Birth Reporting Organization Country (Custodian) Physician State (Service Event) Physician Country (Service Event) Physician State (Encompassing Encounter) Physician Country (Encompassing Encounter) Organization State (Encompassing Encounter) Author State Author Country Occupation Code Industry Code Smoking Status Code Type of Primary Payer at Diagnosis Code Histology Code Behavior Code Diagnostic Confirmation Code Primary Site Code Laterality Code TNM Clinical Stage Group Code TNM Clinical Stage Descriptor Code TNM Edition Code TNM Clinical Staged By Code	Patient's City Patient's State Patient's Country Patient's State of Birth Patient Country of Birth Reporting Organization Country (Custodian) Physician State (Service Event) Physician Country (Service Event) Provider Referred to State Provider Referred to Country Reporting Organization State (Custodian) Physician State (Encompassing Encounter) Physician Country (Encompassing Encounter) Author State Author Country Author Organization State Author Organization Country Organization State (Service Event) Organization Country (Service Event) Physician Organization State (Encompassing Encounter) Physician Organization Country (Encompassing Encounter) Is Patient Deceased? (True=Yes)

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	TNM Clinical T Code TNM Clinical N Code TNM Clinical M Code Active Problem Code Procedure Code (Related to Results) Procedure Code Site of Procedure Code Medication Route Code Medication Site Code Medication Administered Route Code Medication Administered Site Code Provider Referred to State Provider Referred to Country Organization Referred From State Organization Referred From Country Author Organization State Author Organization Country Organization State (Service Event) Organization Country (Service Event)	
Invalid Value in Code System	Patient's State Patient's Country Patient's Gender Code Patient's State of Birth Patient Country of Birth Patient's Marital Status Code Author State Author Country Author Organization State Author Organization Country Reporting Organization State (Custodian) Reporting Organization Country (Custodian) Physician Specialty (Service Event) Code Physician State (Service Event) Physician Country (Service Event) Organization State (Service	Patient's Gender Code Patient's Race Code Patient's Additional Race Code Patient's Ethnicity Code Patient's Marital Status Code Physician Specialty (Service Event) Code Vital Sign Type Code Primary Site Code Problem Code Smoking Status Code Medication Administered Product Code Medication Product Code Histology Code Behavior Code Diagnostic Confirmation Code Laterality Code

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	Event) Organization Country (Service Event) Physician Specialty Code (Encompassing Encounter) Physician State (Encompassing Encounter) Physician Country (Encompassing Encounter) Organization State (Encompassing Encounter) Organization Country (Encompassing Encounter) Provider Referred From State Provider Referred From Country Organization Referred From State Organization Referred From Country Provider Organization Referred to State Provider Organization Referred to Country Provider Referred to State Provider Referred to Country	TNM Clinical Stage Group Code TNM Clinical Stage Descriptor Code TNM Pathologic Staged By Code TNM Pathologic N Code TNM Pathologic M Code Procedure Code Site of Procedure Code Physician Specialty Code (Encompassing Encounter) Occupation Code Industry Code Author Specialty Code Grade Code TNM Pathologic Stage Group Code TNM Pathologic Stage Descriptor Code TNM Clinical T Code TNM Clinical M Code TNM Clinical N Code TNM Pathologic T Code TNM Clinical Staged By Code Family Member Code Family Member Problem Code Health Status Code
Invalid formatting (SSN, NPI & CPT/HCPCS)	Patient's Social Security Number Author NPI Author Organization NPI Reporting Organization NPI (Custodian) Organization NPI (Service Event) Organization NPI (Encompassing Encounter) Provider Referred From NPI Organization Referred From NPI Provider Organization Referred	Patient's Social Security Number Provider Referred From NPI Author NPI Reporting Organization NPI (Custodian) Physician NPI (Service Event) Physician NPI (Encompassing Encounter) Organization Referred From NPI Author Organization NPI Organization NPI (Service

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	To NPI Provider Referred to NPI Procedure Performer NPI Procedure Organization Performer NPI Physician NPI (Service Event) Physician NPI (Encompassing Encounter) Procedure Code (Related to Results) <ul style="list-style-type: none"> • CPT (Code System OID= 2.16.840.1.113883.6.12 • HCPCS (Code System OID= 2.16.840.1.113883.6.285 Procedure Code <ul style="list-style-type: none"> • CPT (Code System OID= 2.16.840.1.113883.6.12 • HCPCS (Code System OID= 2.16.840.1.113883.6.285 	Event) Organization NPI (Encompassing Encounter) Procedure Code <ul style="list-style-type: none"> • CPT (Code System OID= 2.16.840.1.113883.6.12 • HCPCS (Code System OID= 2.16.840.1.113883.6.285
Cancer Reportability	Primary Site Code <ul style="list-style-type: none"> • ICD-9-CM reportability list • ICD-10-CM reportability list 	Primary Site Code <ul style="list-style-type: none"> • ICD-9-CM reportability list • ICD-10-CM reportability list
Date Formatting	Date/Time of Report Author Time Patient's Address Start Date Patient's Address End Date Patient's Date of Birth Service Event Start Date Service Event End Date Encompassing Encounter Date Encompassing Encounter Start Date Encompassing Encounter End Date Occupation Start Date	Date/Time of Report Author Time Patient's Address Start Date Patient's Address End Date Patient's Date of Birth Patient Deceased Date Encompassing Encounter Date Service Event Start Date Occupation Date Occupation Start Date Occupation End Date Industry Date

Validation Rule Type	Data Elements/Objects Checked (MU2)	Data Elements/Objects Checked (MU3)
	Occupation End Date Industry Start Date Industry End Date Smoking Status Start Date Smoking Status End Date Diagnosis Date Active Problem Start Date Active Problem Stop Date Procedure Start Date (Related to Results) Procedure End Date (Related to Results) Result Date Procedure Date Procedure Start Date Procedure End Date Medication Start Date Medication Stop Date Medication Administered Start Date Medication Administered Stop Date	Industry Start Date Industry End Date Smoking Status Date Procedure Start Date Diagnosis Date Medication Start Date Medication Sop Date Medication Administered Start Date Medication Administered Stop Date Problem Start Date Problem Stop Date