# Chapter 12: Consolidating Data

One of the primary functions of a central cancer registry is to consolidate cancer data from multiple reporting facilities for the same patient. This involves combining data received on multiple records into one comprehensive data set. In SEER*DMS, the consolidated data for a registrant are stored in a single packet of data known as a "patient set." The consolidation process may involve consolidating data from multiple records and creating a new patient set, or consolidating data from one or more records into an existing patient set.

The SEER*DMS Patient Set Editor includes features specifically designed for consolidating data. You will use the Source Data Viewer to compare standard data fields on the new records to the same fields in the patient set. To save time and avoid potential keying errors, you can use this tool to update the patient set while reviewing data from all sources. You will use the Course Page to compare the values on individual treatment reports to the summarized treatment values. Finally, you will be able to review a log of the changes already made to the patient set and document the changes that you make to the data. The features of the Patient Set Editor used specifically for consolidation are described in this chapter. If you haven't already, you should review the general description of the editor provided in *Chapter 11: The Patient Set Editor*.

The Patient Set Editor is an extremely flexible tool. It does not impose a specific sequence of steps or restrict the methods that you use to consolidate data; however, it is recommended that you follow the practices and guidelines described in this chapter. First, confirm that all data pertain to the same patient. Second, incorporate the data into the appropriate sections of the patient set. Once you have linked the incoming records and updated the summarized patient set data, you may either resolve data errors or you may save the consolidated patient set and allow the errors to be resolved in a Resolve Patient Set Errors task (these procedures vary by registry policy).

"Consolidate" tasks in SEER*DMS involve the consolidation of medical data from reportable records. A separate discussion of the manual and automatic tasks to consolidate follow-up data obtained on motor vehicle records, non-reportable death certificates, and other supplemental records can be found in *Chapter 16: Follow-up*.

In this chapter, you'll learn about

- Data Consolidation in SEER*DMS
- Workflow Processes that Create Consolidate Tasks
- Using the Patient Set Editor in a Consolidate Task
- Verifying the Patient Match
- Linking the Incoming Records
- Selecting a Record to Build a Patient Set
- Consolidating Demographics Data
- Consolidating CTC Data
- Saving Changes
- Undoing Changes

# Data Consolidation in SEER*DMS

When consolidating data in SEER*DMS, you will perform these basic steps:

1. **Confirm that the data are for the same person.** The results of the matching task must be confirmed in the consolidate task.
2. **Use DX Info to link the incoming records to data in the patient set.** Review each record to determine whether the data are related to an existing CTC or represent a new CTC. Records may be linked to a CTC or linked at the patient level.
3. **Update the demographic page of the patient set with data from the incoming records.** Use the Source Data Viewer to review and resolve discrepancies between incoming records and the patient set. The Data Viewers shows the value of fields on all records so that you can identify the source of a data item. You may view data from all records or only view records with differences.
4. **Update the CTC data with the best record data.** Review all text before proceeding (text is displayed in the right panel or can be opened in the Text Viewer).
    a. **Consolidate data on the main CTC page.** Review supporting text and use the Source Data Viewer to review data on the incoming records. You may manually modify fields or copy values from the record. Do not set the Review flag on the CTC page until all treatment and facility pages are reviewed (the CTC review flag also clears warnings on the Facility, TX, and Summary TX pages).
    b. **Consolidate data on the Staging page.** Review supporting text and use the Source Data Viewer to review data on the incoming records.
    c. **Review newly created Facility pages and new admissions on existing pages.** Review data and resolve edits for new admissions in the patient set data. Links to new pages are shown in bold. If new admissions were added to an existing Facility page, the Facility link would not be shown in bold. Check the data for each facility that provided an incoming record.
    d. **Review newly created Treatment data pages (TX and TXr links).** Compare coded data to supporting text, review associated admission data, and resolve edit errors. Links to newly created TX and TXr pages are shown in bold. You may use the Course Page to compare one TX or TXr to another.
    e. **Resolve edit errors that are not associated with Summary TX review flags**. Most edits should have been resolved as you reviewed the demographics, CTC, staging, facility, and treatment data. Confirm that all edits on TX and TXr pages have been resolved prior to reviewing the summarized treatment data. If you do not know how to resolve an edit or do not have the appropriate permissions to do so, you will have the opportunity to save the patient set with edit errors. They will be resolved in a Resolve Patient Set Errors task later.
    f. **Review the Summary TX data page and Course Page.** Review the summarized data that the polishers set for each treatment modality. If the polisher identified missing or conflicting data, the review flag associated with the treatment modality will be set to 0 (Needs Reviewed) and an error will be generated. You can compare all TX and TXr data in the Course Page. If changes are made in the underlying treatment data, the polishers will update the summarized data.
5. **Save the Patient Set and Exit the Consolidate Task.** If you save a patient set with edit errors, it will be forwarded to a Resolve Patient Set Errors task.

## Workflow Processes that Create Consolidate Tasks

Requires system permission: *consolidate and pat_edit; other permissions that may be involved are: pat_delete, pat_undelete, pat_edit_overrides*

Data are not consolidated unless it is determined that the data are for the same person. This process begins in automated and manual matching tasks, and continues with a final confirmation in the Consolidate task. Since matching is a prerequisite to consolidation, the manual matching task is known as "Match-Consolidate". The match is refreshed when the Match-Consolidate task is opened to ensure that the incoming record was matched against all appropriate data, including data that were recently loaded. (see *Chapter 10: Matching Incoming Records to Existing Data*.)

The person performing the Match-Consolidate task selects records and/or a patient set to consolidate.

- If a patient set exists for the patient, a manual task is created to consolidate the record data into that patient set.
- If the incoming record matched other records but not a patient set, SEER*DMS will determine if a patient set can be built from the record data (the user completing the task may also be prompted to make this decision). A Consolidate task will be created if a new patient set is built from multiple records.

If the person completing the match task has the Consolidate system permission, the Consolidate task will be opened immediately. If the user does not have the Consolidate permission, an unassigned Consolidate task will be created in the worklist.

SEER*DMS will also create manual Consolidate tasks if there are failures during automated consolidation tasks. For example, SEER*DMS will auto-consolidate a reportable death certificate into a matching patient set. If there is a conflict in a data item during the auto-consolidation, a manual Consolidate task is created. (The specific matching and auto-consolidation rules for death certificates vary by registry and are documented in the SEER*DMS online help system.)

## Using the Patient Set Editor in a Consolidate Task

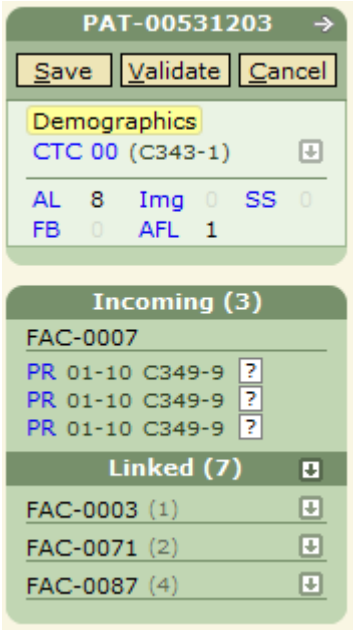
A Consolidate task enables you to combine data received on multiple records into one comprehensive data set, i.e., the patient set. You may be creating a new patient set by consolidating data from multiple incoming records; or you may be consolidating incoming data from one or more records into an existing patient set.

In a Consolidate task, the navigation on the left-hand side of the editor is modified slightly to differentiate the incoming records from records that were previously linked to the patient set (if any exist). If a new patient set is being built in the Consolidate task, the patient set will have been auto-built from one of the incoming abstract records. This provides a starting point for creating the patient set. If you would prefer to build the patient set from a different record, refer to the instructions in the *Selecting a Record to Build a Patient Set* section of this chapter.

The navigation section of a Consolidate task has three sections as displayed in the diagrams on the following pages. Codes are used to convey record type, month and year of diagnosis, cancer site, laterality, and linkage.

## Sample Navigation Boxes in Consolidate Tasks

These examples illustrate the type of information displayed in the navigation boxes of a Consolidate task.

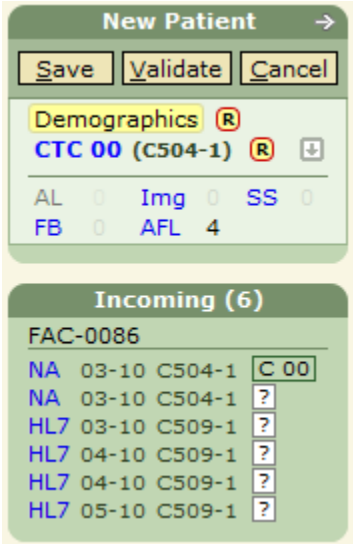



**Overview:** Three records from FAC-0007 were loaded into SEER*DMS. The records match an existing patient set.

**Pat-00531203:** The patient set ID is shown as the header of the navigation box. You may click the ID or the right arrow to open the patient set menu. The page currently being displayed is the patient set's Demographics page (as indicated by the highlighting of the word Demographics). This patient set includes one CTC. The sequence number is 00. The site coded on this CTC is C343 and laterality is 1 (cancer of the right lower lobe of the lung).

**Incoming (3):** In this task, three Pathology Reports are being consolidated into an existing patient set. The reporting facility (FAC-0007) is displayed above the list of incoming records. The three pathology reports have an event date of January 2010. Site is coded as C349 and laterality is unknown (9). The ? icon next to each record indicates that the incoming records have not yet been linked.

**Linked (7):** At some point prior to this Consolidate task, seven records were consolidated into this patient set. One record was received from FAC-0003, two from FAC-0071, and four from FAC-0087. To see the record type or view record data from a facility, click the down arrow next to the facility ID. To expand the list for all facilities, click the down arrow next to "Linked (7)".



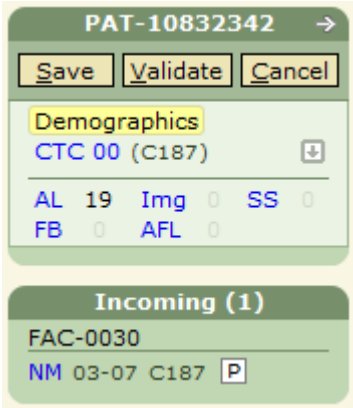

**Overview:** Six records received from one facility (FAC-0086) were loaded into SEER*DMS. The records did not match a patient set in the database, but matched each other. These records provide data for a new patient, therefore, a new patient set was created for this task.

**New Patient:** A patient set ID has not yet been assigned; therefore "New Patient" is displayed as the header of the navigation box. You may click on the links in this box to view other patient set data pages (the highlighting of Demographics indicates that it is the current page being displayed). This patient set has one CTC that has C504 coded for site and 1 for laterality. The R icons indicate that there are Review flags on the Demographics page and on a page within the CTC that are set to "Needs Review".

**Incoming (6):** The patient set was auto-built from the first NAACCR abstract record, the one with "C 00" next to it. (The CTC for the base record is displayed in a clear box). The other records have not been linked, as indicated by the ? icons.

For each record, you see the record abbreviation, event date, site and laterality. NA is the abbreviation for NAACCR Abstract and HL7 is the abbreviation for HL7 E-path. The first record is a NAACCR Abstract with a date of diagnosis of 03-10 (March 2010).

If you click the record type, the record will be opened in the editor.




**Overview:** One record received from FAC-0030 was loaded into SEER*DMS. The record matched a migrated patient set in the database.

**PAT-10832342:** The patient set ID is shown in the header of the navigation panel. Click the ID or the right arrow to open the patient set menu.

**Incoming (1):** This consolidation involves combining a single incoming record with an existing patient set. The record is a NAACCR Modified record (NM), date of diagnosis is March 2007, and the cancer site is C187 (colon). Laterality is not shown because it is 0 (not paired).

**No Linked Records :** There are no records linked to this patient set. This patient's data were entered and consolidated in the registry's prior data management system. The consolidated data were loaded into SEER*DMS when the registry switched to the new system, but the source records were not linked. Sufficient linkage information may not have been available in the migrated data; or the source records may be older and may not be available in electronic format. This situation cannot occur in patient sets created in SEER*DMS and only affects migrated patient sets.

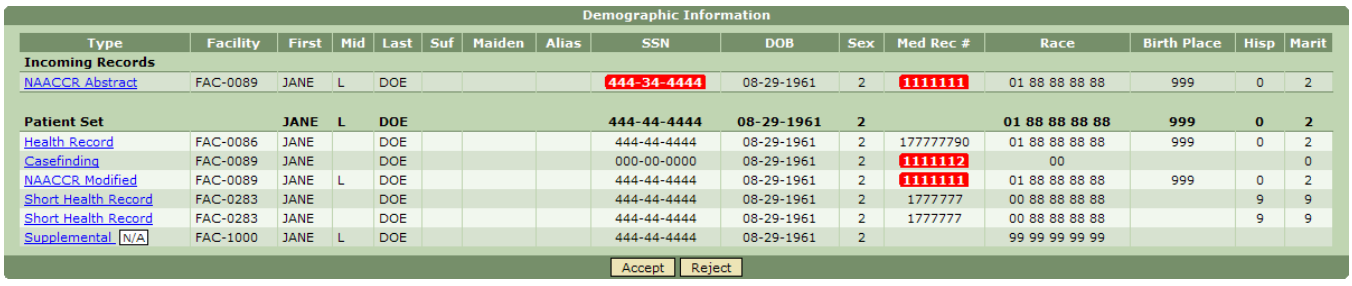
## Verifying the Patient Match

Requires system permission: *consolidate* and *pat_edit*

Matches are initially selected in the Match-Consolidate task. The first step of the Consolidate task is to review additional data fields to confirm that the data to be combined are for the same person.

*To verify the patient match for incoming records in a Consolidate task:*

1. The Demographic Info window is displayed when you first open a Consolidate task. The values of data fields from each record are displayed. New records being consolidated into the Patient Set are listed in the Incoming Records section at the top. A record field is highlighted if the value differs from the value in the Patient Set. The exception is Medical Record Number; it is highlighted if there is a discrepancy between any records from the same facility.




2. Review all discrepancies and determine if all records contain data for the same patient.
   a. If the records are for the same patient, click **Accept** to close the popup window. Refer to the *Consolidating Demographic Data* section of this chapter for further instructions.
   b. If any of the incoming records are for a different patient, click **Reject**. The Consolidate task will be canceled. You will be returned to the match portion of the Match-Consolidate task. The patient set will be unchanged.

An incoming record may be rejected during subsequent steps in the consolidation process using the Reject item on the record's menu. However, data from the record may have been incorporated into the patient set. You would need to edit data fields manually to remove that data.

The Reject All item in the record menu is equivalent to rejecting the match in the Demo Info popup. The Consolidate task will be canceled and you will be returned to the match portion of the Match-Consolidate task. If the focus record that triggered the original Match-Consolidate task is rejected, the task must be canceled so that the focus record can be rematched. Therefore, Reject All is the only option for rejecting the focus record.

## Linking the Incoming Records

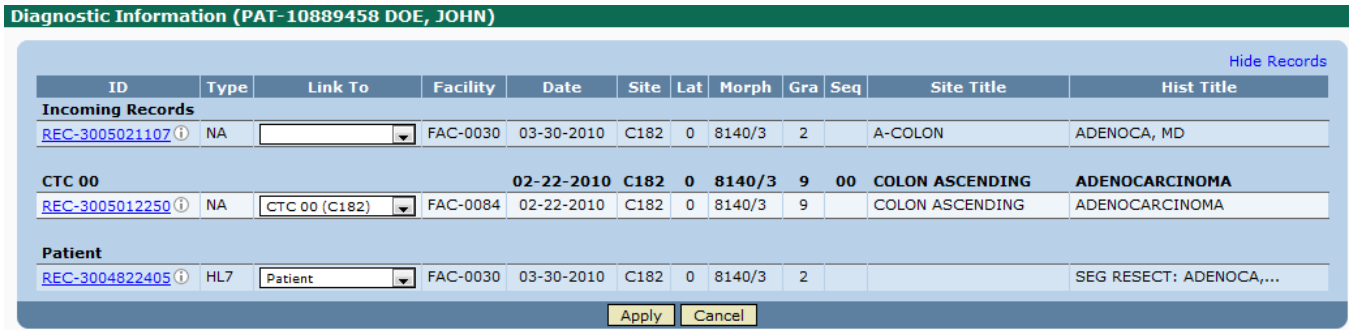
Requires system permission: *consolidate* and *pat_edit;*

In the SEER*DMS database, a Cancer/Tumor/Case (CTC) is a packet of data related to a single incident cancer. The CTC includes summarized treatment information, as well as data regarding each admission and treatment procedure. A patient set may include multiple CTCs, one for each primary cancer diagnosed for the patient.

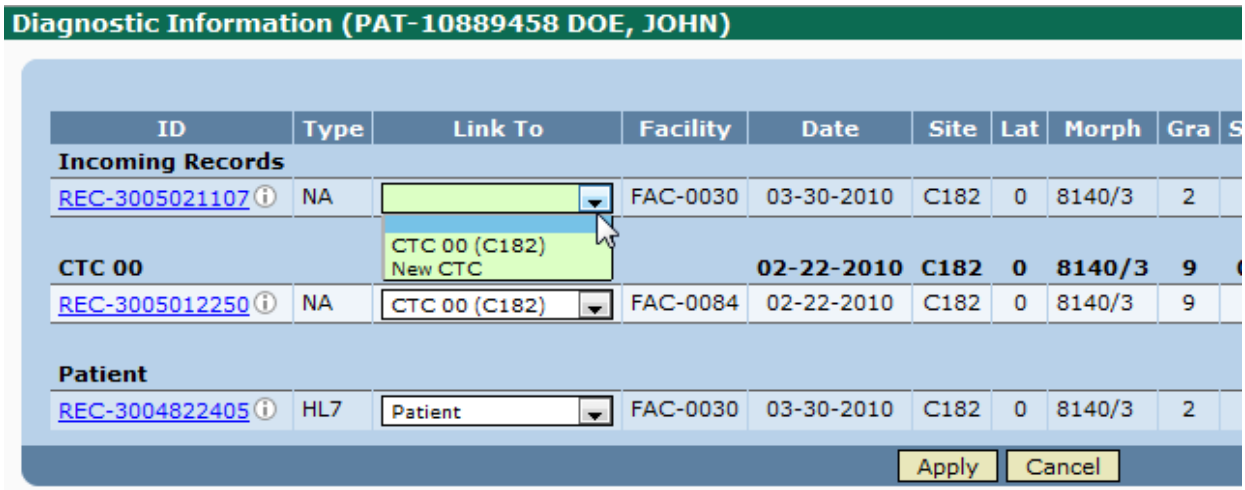
You must review each incoming record to determine whether it is related to an existing CTC or represents a new CTC. If the record data are related to an existing CTC, you will link the record to that CTC. If the data are for a new CTC, you may create a new CTC based on the record. The data entities in the new CTC will be auto-built based on values in the record. If the incoming record indicates a new cancer but is not an abstract, you will have the option of building a CTC now or linking the record at the patient level and building the CTC when an abstract is received.

*To link a record to the appropriate data structure in the patient set:*

1. Click **DX Info** in the title bar of the page to open the Diagnostic Information window.

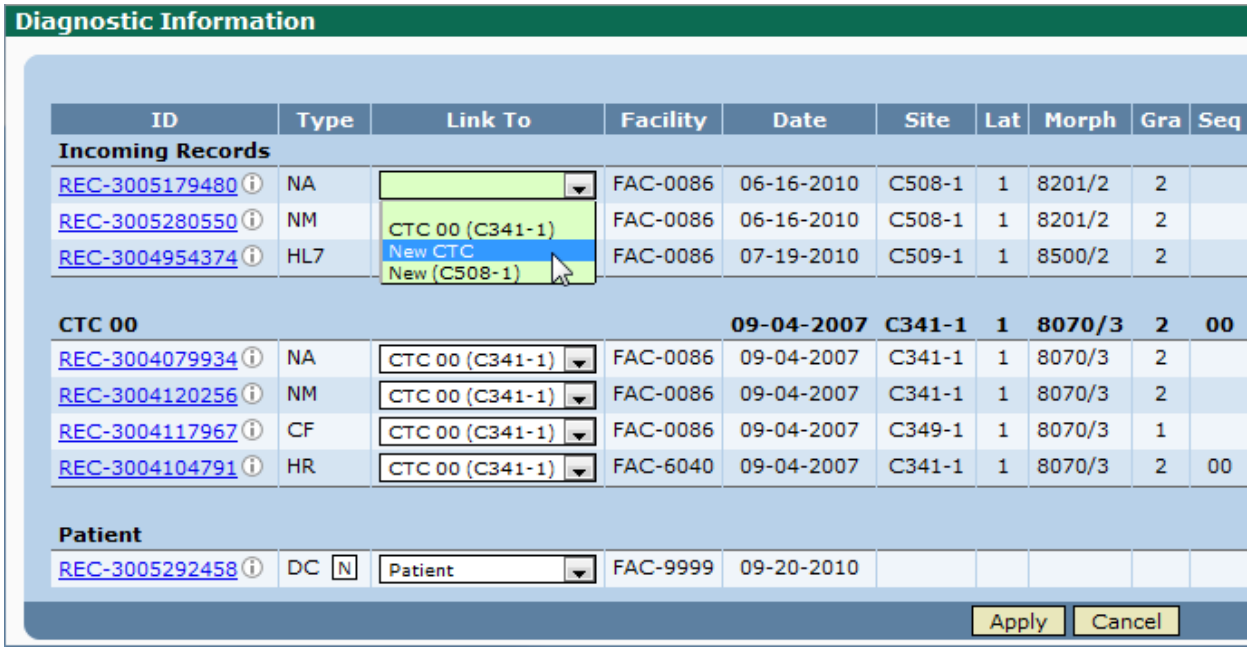



2. The Diagnostic Information displays diagnostic data fields from the incoming records, records previously linked to a CTC, and records previously linked at the patient level. The consolidated values for each CTC are shown in bold, just above the record(s) that are linked to that CTC.
3. Compare the data of each incoming record to the CTC data fields (you may also click the Record ID to view additional data). When you complete your review, select a value from the drop-down menu in the **Link To** column. In the example below, the choices are to link to a CTC that has sequence number = 00 and site = C182; or to create a new CTC from the incoming NAACCR Abstract record.

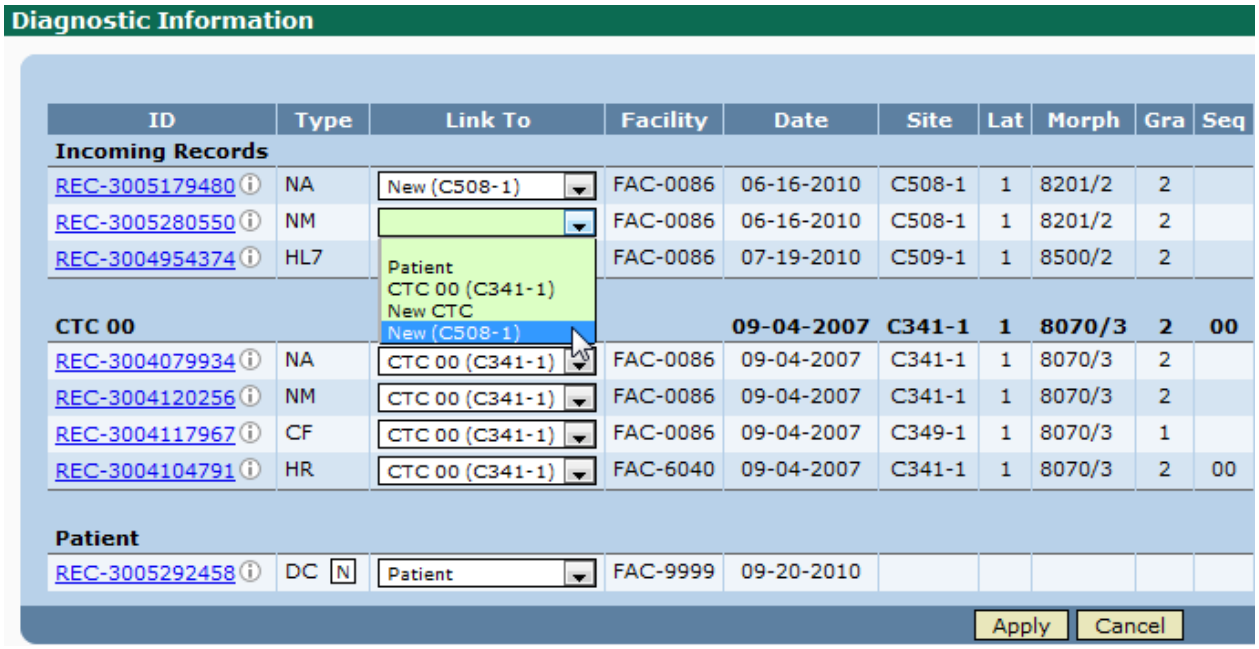



a. If you determine that the incoming record should be linked to an existing CTC, select that CTC. In this example, the NAACCR Abstract (NA) would be linked to CTC 00.

If an incoming record represents a new CTC, select New CTC. An additional option will be added to the drop-down list for the new CTC. The record's site and laterality are shown in the menu. You may assign other records to the new CTC, if appropriate. The example below is for a different patient set. In this example, a New CTC is created from one of the Incoming Records.




The drop-down list now includes an entry for the new CTC for C508. All of the incoming records will be linked to that CTC. If you have multiple records for a new CTC, you do not need to worry about the order in which you select the records. SEER*DMS will automatically select the best record to build the CTC when you apply your changes.




b. If you would like to link a record to the Patient Set but not to a particular CTC, select Patient. The use of this option varies among registries. In some registries, death certificates and case finding records are linked at the patient level. A CTC is not created until an abstract is received. Later, when the abstract record is received and used to build the new CTC, you can reassign this link to the CTC. (Abstract records cannot be linked at the patient level.)

c. Click **Apply**. If the record is linked to a CTC, "C *NN*" will be displayed next to the record type in the record navigation box. This indicates that the record is linked to the CTC that has a central sequence number equal to *NN*. If the record is linked at the patient level, P is displayed. SEER*DMS attempts to set the sequence number appropriately, based on the central sequence number coded in the record and the number of CTCs in the patient set. If you have multiple CTCs with the same sequence number, you should review the CTCs and manually adjust the sequence numbers.

## Selecting a Record to Build a Patient Set

If records are being consolidated to create a new patient set, a patient set will be built from one of the records. The patient set will be built from an abstract record, if available. Otherwise, the record will be built from a pathology report, casefinding, death certificate, or short health record. The records are considered in order of priority, based on registry configuration settings.

If there are two records with the highest priority, SEER*DMS chooses one based on dates. You may determine that a different record has more detailed information, for example, it may have more staging information. You may be able to reduce data entry and save time by building the patient set from the other record.

If you would prefer to build the patient set from a different record, you may re-build the patient set. Any changes that you entered manually will be lost. The consolidate task will essentially start over and the patient set will be built from the record that you choose.

*To re-build a patient set using a different record:*

1. In the left navigation panel, select the record that you wish to use to build the patient set. Open that record in the editor.

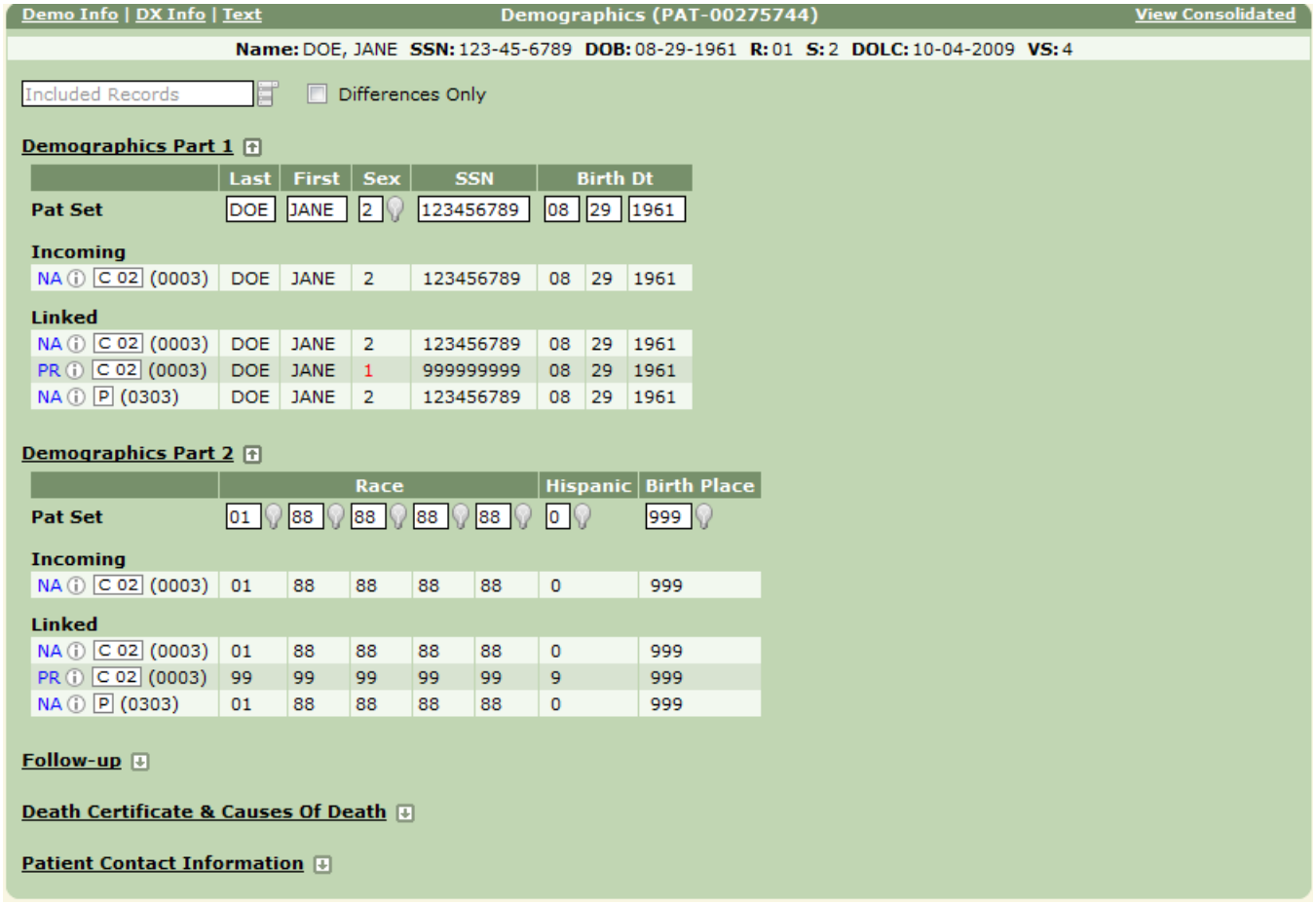
2. Click the arrow to open the record's menu.
3. Select **Re-build Patient Set**

## Consolidating Demographics Data

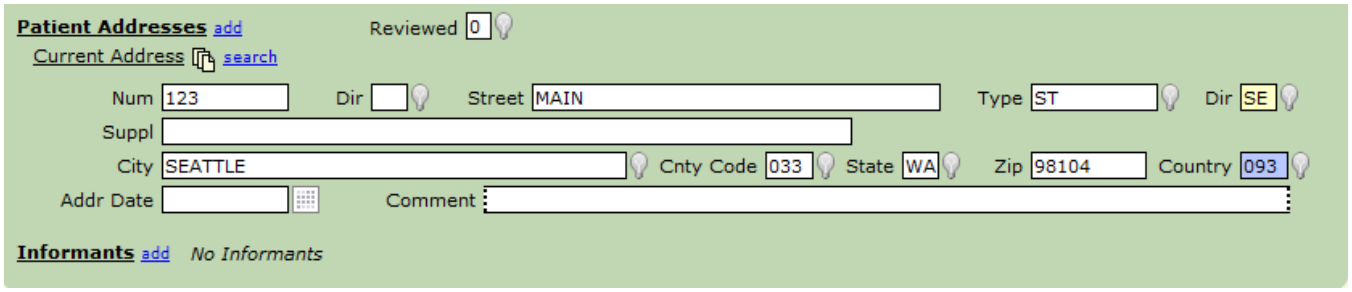
Requires system permission: *consolidate* and *pat_edit*

After verifying the patient match and linking the incoming records, begin the consolidation process by reviewing the data on the Demographics page and then resolving discrepancies between the fields on the Demographics page of the patient set with the same data fields in the incoming records. If you are consolidating multiple records to create a new patient set, the patient set fields will contain data from the record used to auto-build the patient set.

If you determine that a record contains more complete or accurate information, update the patient set with the best data. The Source Data Viewer enables you to compare data fields on records with the fields in the patient set, and it provides a convenient method to copy values into the appropriate patient set fields. The Source Data Viewer is described in detail in *Chapter 11: The Patient Set Editor*. This screen shot shows the Demographics page of a patient set n the View Source Data mode. Work through each section of the page. Click the arrow to collapse a section when you complete your review of that section. You can modify the Patient Set fields directly or click one of the record's values to copy it into the patient set field.

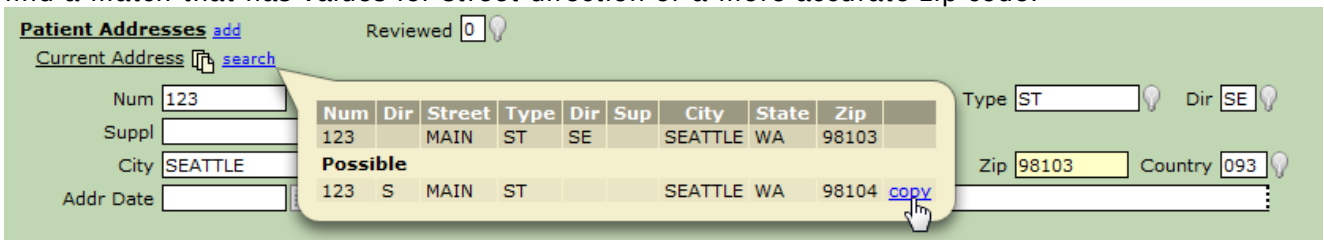


If your registry actively maintains and updates the patient's current address, you must use the controls in the Consolidated View to verify and update the address. Click **View Consolidated Data** to close the source data viewer. The Patient Addresses section is shown below.




- Multiple addresses can be stored as the patient's current address. This allows your registry to store seasonal and secondary addresses. To add an address, click **add** next to Patient Addresses. You will be able to specify one address as primary and the others as secondary.
- Click the multi-page icon next to one of the Current Addresses to open the Summary Address Information window. This popup window shows the current address provided in each record, and the address at diagnosis in each CTC and record. If appropriate, you may copy one of the addresses into the Current Address field.


- In the Patient Addresses section of the Demographics page, search for the address in the SEER*DMS geocoding database. Compare the possible matches to the current value. If you find a match with more complete information, copy that address. For example, you may find a match that has values for street direction or a more accurate zip code.




You must follow registry protocols regarding address verification. You may be required to verify the address using data from the Department of Motor Vehicles or other sources.

## Consolidating CTC Data

After a record is linked to a CTC, SEER*DMS executes the auto-consolidation rules for that type of record. These rules will automatically update a small number of fields on the Demographics, CTC, and Staging pages.

SEER*DMS also uses the record data to create new treatment, facility, and admission data within the CTC. New TX, TXr, and Facility pages may be created; and new admissions may be added to

existing Facility pages. The registry configuration may include algorithms to prevent the creation of duplicate treatment, facility, or admission data entities.

A TX page is created for treatment reported and given by the same facility. A TXr page is created for treatment reported by one facility, but provided at a different facility. The addition of the new treatment data triggers the SEER*DMS polishers to update the Summary TX data fields. The Summary TX data values will be recalculated based on all available TX and TXr data, including the treatments created from the newly linked record.

The Source Data Viewer is available on pages that contain data consolidated from multiple records. Therefore, it can be used on the Demographics, CTC, and Staging pages. The Summary TX page contains data summarized from other pages within the CTC, it is not consolidated directly from the records. The Course Page allows you to compare TX, TXr, and Summary TX values.

*To consolidate data into an existing CTC:*

1. Consolidate data on the Main CTC page.
    a. Review supporting text and visually edit the coded data fields.
    b. Use the Source Data Viewer to compare values on the incoming records to the consolidated patient set fields. In the Source Data Viewer, you may manually modify fields or copy values from the record.
    c. Do not set the Review flag on the CTC page until all treatment and facility pages are reviewed (the CTC review flag also clears warnings on the Facility, TX, and Summary TX pages).
2. Consolidate data on the Staging page.
    a. Compare the coded data fields to the text shown in the right panel.
    b. Use the Source Data Viewer. Compare values on the records to patient set fields. Make any necessary modifications.
3. Review newly created Facility pages and new admissions on existing pages.
    a. Review data and resolve edits for new admissions in the patient set data. Links to new pages are shown in bold. If new admissions were added to an existing Facility page, the Facility link would not be shown in bold.
    b. Check the data for each facility that provided an incoming record.
4. Review newly created Treatment data pages (TX and TXr links). SEER*DMS polishers use the data on these pages to update the Summary TX data. Therefore, it is important to review and visually edit these data prior to reviewing the Summary TX data. Links to new TX and TXr pages are shown in bold. Follow the steps below for each page:
    a. Compare coded data on the TX and TXr pages to supporting text.
    b. Review associated admission data (if an admission is related to the treatment, a link to the admission will be displayed on the treatment page in the Adm FAC-ID field).
    c. Resolve all edit errors on each TX and TXr data page. This must be done before proceeding to the review of the Summary TX data. If you do not know how to resolve an edit or do not have the appropriate permissions to do so, you may save the patient set with edit errors. The edits will be resolved later in a Resolve Patient Set Errors task.
    d. If you would like to view the source record during this review, the record type of the source record is displayed as a link on the right side of TX and TXr pages.

e. Use the Course Page to compare one TX or TXr to another. To open the Course Page, click “SEER Course 1” in the navigation panel.

5. Review and complete the consolidation of the summary treatment data:

   a. Click the Summary TX link in the left navigation box. Review the summarized values set by the polishers for each treatment modality. If the polisher identified missing or conflicting data, the review flag associated with the treatment modality will be set to 0 (Needs Reviewed) and an edit error will fail.

   b. The values of the SEER Course 1 dates and the Summarized Diagnostic Procedures are automatically set by the polishers. Therefore, these fields are read-only and cannot be modified by the user. To make a change to these fields you must modify the underlying values on TX or TXr data pages.

      i. Review the summarized Surgery Treatment data. Click the  multi-page icon or the SEER Course link in the navigation panel. This will take you to the Course Page. Compare the summarized data to the contributing data.

      ii. Modify the Summary Treatment fields, as necessary. When you complete the process for Surgery Treatment data, set the Surg Rev flag to 1 (Reviewed).

      iii. Repeat this process for the Radiation and Systemic sections. There is a separate review flag for each.

6. After reviewing all data pages, resolve any edits that are failing.

7. Set CTC Review flag on the main CTC page.

8. Repeat steps 2 through 7 for each CTC that requires consolidation.

## Saving Changes

Changes cannot be saved unless all records are linked. If you have made significant changes and would like to save them, verify that all incoming records are linked to a CTC or to the patient set.

*To save changes during a Consolidate task:*

1. Click **Save**.
2. Enter comments to document your changes.
3. If you would like to continue working on the task, click the **Save** button at the bottom of the Review Changes page. This is not an option if you are creating a new patient set.
4. If you would like to exit the task, click **Save & Exit**. If edits are failing, the patient set will move forward a Resolve Patient Set Errors task. If there are no errors, the patient set will exit the workflow.

## Undoing Changes

Requires system permission: *pat_edit*

If you made changes that you do not want to save, use the undo feature. This will reverse all unsaved changes made during the consolidation process. If consolidating data into an existing patient set, the values of the patient set data fields will be reloaded from the database. In addition to reverting changes made to data fields, the linking of records and all other modifications will be reverted. If you rejected a record during the task, that change was saved immediately and is not reverted by the undo feature. If you wish to consolidate that record into this patient set, you would need to find the record and rematch.

*To reload the patient set from the database and revert changes in a Consolidate task:*

1. Hold your mouse near the ▫ menu indicator in the patient navigation box. The patient set menu will be displayed.
2. Select **Undo Changes**.
3. Click **OK** to confirm.