

# NAACCR 2018 Implementation

2018 SEER\*DMS & SEER Data Quality Combined Meeting

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# NAACCR 2018 Implementation

*As a standard setting organization, NCI SEER feels that **the data we collect must be as closely aligned as possible with the guidelines used in the clinical setting.** These include CAP cancer protocols, NCCN guidelines, WHO classifications, and the AJCC 8<sup>th</sup> ed. Standards.*

*Steven Friedman, Lynne Penberthy  
National Cancer Institute*

# NAACCR v18

- Develop standards for registry data that are coordinated with **clinical guidelines**
- 223 new data items; numerous changes to existing data items
- Many of the v18 changes are related to **staging**:
  - 8<sup>th</sup> edition AJCC staging standards
  - Extent of Disease
  - Summary Stage 2018
  - Site-Specific Data Items (SSDI)
- Re-defined **tumor grade** using three site-specific fields: Grade Clinical, Grade Pathological, Grade Post-therapy
- **Radiation** coded and reported with increased granularity and for up to three separate phases of radiation treatment
- **2018 Solid Tumor Coding Rules** replace the 2007 MP/H rules for determining multiple primaries for major sites (breast, colon, head & neck, kidney, lung, CNS, urinary sites)

*“The Version 18 transmission file includes a record number of changes.”*

# SEER Systems affected by N18

- SEER Registrar Staging Assistant (SEER\*RSA)
  - SEER\*RSA website
  - API Access
  - Staging libraries (Java, C#)
- SEER Data Viewer
- SEER edits and the SEER\*Edits application
- SEER Data Management System (SEER\*DMS)
- SEER Abstracting Tool (SEER\*Abs)
- 2018 Solid Tumor Rules (Java library)
- SEER\*Stat and SEER\*Prep
- SEER API

# N18 Implementation Timeline

N18 Specifications

• March 2, 2018

SEER\*RSA

• March 20, 2018

Data Viewer

• April 18, 2018

SEER Edits

• First released in May; updated Sep 2018

SEER\*DMS

• May 11, 2018

SEER\*Abs

• May 16, 2018

Solid Tumor Rules

• October 2018 (currently in testing)

SEER\*Prep

• Work in progress

# SEER\*Abs

- Configurable data entry tool specifically designed for abstracting cancer information
- An abstractor's assignments ("to do list") can be managed in the SEER\*Abs worklist
- Data from the central registry database can be loaded as reference data
- Full integration of abstracting tools:
  - Edits run in real time. SEER edits are packaged by default; also supports NAACCR and registry edits
  - SEER\*RSA Staging Libraries
  - Standard lookups, site-specific and schema-specific lookups
  - SEER and NAACCR Coding Manuals
  - NAACCR export files (XML and fixed column formats)

# SEER\* Abs Changes for N18

## Version 2.12 (released on 05/16/2018)

Version	Ref	Description
2.12		Now loading SEER*RX drugs from JSON file instead of XML.
2.12		Changed technical support email in the About dialog.
2.12		Updated TNM staging to version 1.8 and EOD staging to version 1.2.
2.12		Updated SEER edits to version SE18-018-01.
2.12		Fixed field documentation sometimes not rendering properly because of special characters.
2.12		Fixed an error happening when clicking an edit dependency in the edit info dialog.
2.12		Added support for default EOD lookups.
2.12		Added support for displaying markdown help for new staging lookups.
2.12		Fixed a bug in the copy record feature resulting in some staging field being blanked out when copying a record.
2.12		Changed value of DEAD for vital status from 4 to 0 as per NAACCR 18 specifications, all existing records will be migrated.
2.12		Switched default installation to NAACCR 18.
2.12		Added support for a provided licensed EOD staging algorithm; by default the application only contains the publicly available EOD algorithm but this will allow registries to plug the licensed version if they are allowed to.
2.12		Added support for EOD staging page.
2.12		Added specific logic for Grade field on the Disease search page to align with the behavior of the corresponding website.
2.12		Added dependencies required for the application to run under Java 9.

# SEER\*Abs

- SEER\*Abs is freely available to any registrar; it is easy to download and install. Minor configuration changes would be recommended for production use (examples: select edits; add facility and physician lists)
- SEER\*Abs can be used to abstract cases in the NAACCR v18 layout.
- But...
  - SEER\*Abs is not a data management system.
  - It is designed for field abstracting, that is, it was designed for a single instance to be installed on each registrar's laptop.
  - Data from SEER\*Abs are exported and transferred to a cancer registry.
- And so...
  - SEER\*Abs is a great tool that can be updated quickly by IMS to support new standards
  - SEER\*Abs should definitely be considered by registries that do not require full data management features. It should also be considered as a stop gap solution when new standards are released.



# Acknowledgments

- In addition to my co-presenters, I would like to acknowledge:
  - **Katherine Kirby** – technical lead for SEER\*Abs
  - **Fabian Depry** – system design and original implementation of SEER\*Abs, Data Viewer, and a lead developer for SEER\*DMS
  - **Chuck May** – technical lead for SEER\*DMS, SEER API
  - **Suzanne Adams** – IMS lead for Solid Tumor Rule project
  - And the entire SEER\*DMS development team...

**Welcome to your  
NAACCR 18 Journey  
aboard  
SEER\*DMS**

Nicki Schussler

9/27/2018

# A Long Journey

- Initial N18 issues in Squish first posted 11/14/2017
  - Used draft N18 format to draft issues
- NAACCR 18 manual 'finalized' 3/2/2018 (Friday)
  - To date, 340 changes in N18 audit log
- Issues released to IMS staff 3/5/2018 (Monday)
  - Support issues (handling 2018 cases in N16 format; splitting staging page) started earlier
- About 157 NAACCR 18 related issues
  - Earliest completed (related) issues - 3/7/2018
  - 123 completed by 9/20/2018





Canterbury, New Zealand

# First Destination

- SEER\*DMS NAACCR 18 support was released as v18.49 on 5/11/2018
- Important to release something (good) ASAP, even if not perfect
  - Allows you to start capturing data
  - Allows you to provide feedback
- Manuals still changing - rushing to get documents out can lead to overlooking issues/errors

# After Our Arrival....

- What happened after 5/11/2018?
  - AJCC: 41 changes to 8<sup>th</sup> edition
  - EOD: v1.0 released 3/20; DMS live with v1.2, now v1.4
  - NAACCR: 270 changes
  - SEER\*DMS: 94 issues submitted
  - STORE manual (including radiation conversion) released 8/16
  - NPCR stage library released 9/25
  - Implementation Guide released 9/26

# The Changing Landscape

- Everything starts in the Database
  - 9 name changes
  - 9 changes to lookups
  - 1 conversion (Vital Status 4 -> 0 Hooray!)
  - 223 new field – most have associated lookups
    - 133 SSDIs + 3 new Grades: lookups from SEER\*RSA
    - 27 other staging fields (T, N, M, Stage Group, Schema)
    - 24 Radiation fields
    - 32 other fields (and 4 composite fields – Geo Location ID)









# New Landscape: Demographics

- But you interact with Screens!
- Looking at Patient Set - similar changes in NAACCR Abstract, Health Records, Short Health records, etc
- Only 3 new fields on Demographics

**Demographics** Reviewed

Pre  Last  First  M  Suf  SSN

Maiden  Cur Marital  Drivers Lic#  Medicare ID

Archive  Cancer Cnt

Aliases [add](#) No Aliases

Birth State  Country  Birth Place  Birth Dt    Sex  OR Name/Sex

Race     Hispanic  Gender Txt

NAPIIA  Cmptd Eth  Cmptd Eth Src  NHIA  IHS  IHS 2004  Race Reviewed

**Follow-up** AFUP Flag



DOLC    Vital Status  Autopsy  FU Src (CT)  FU Src Cntl

SSA Stat  VS Recode  FU Src



# New Landscape: CTC

- Site/Hist/Beh/Grade layout reorganized due to registry comments





ICD-O-3 (2001+)

Site   Lat  


Site Title



Hist   Behav  



Hist Title





Grade Clin   Grade Path   Grade Post TX   Conv Rev  



Historic Site & Morphology Fields


(1992-2017) Grade  


(2010-2013) Grade Path Val   Grade Path Sys  




ICD-O-2 (1992-2000) Hist  Behav   Conv Rev  




ICD-O-1(1973-1991) Site   Hist  Behav   Grade   Conv Rev  

Multi Cntr   Multi Dt    Multi as 1  

Ambig DX   Conclsv Dt

#Tum/Hist  

Cancer Stat   Dt Last CA Stat    Tobacco Hist   Fam Hist of Ca  

Marital DX   Age DX  Payer DX   CF Source  

# New Landscape: CTC

- New fields in Geographic

**Census Tract**    Census Rev     [refresh census data](#)

2010 <input type="text"/>	Certainty <input type="checkbox"/>	County <input type="text"/>	Block <input type="text"/>	State <input checked="" type="checkbox"/>	Poverty Code <input type="checkbox"/>
2000 <input type="text"/>	Certainty <input type="checkbox"/>	County <input type="text"/>	Block <input type="text"/>	State <input checked="" type="checkbox"/>	
1990 <input type="text"/>	Certainty <input type="checkbox"/>		Block <input type="text"/>		
1980 <input type="text"/>	Certainty <input type="checkbox"/>		Block <input type="text"/>		
1970 <input type="text"/>	Certainty <input type="checkbox"/>		Block <input type="text"/>		
1970-80-90 <input type="text"/>	Certainty <input type="checkbox"/>	County <input type="text"/>	Block <input type="text"/>	State <input checked="" type="checkbox"/>	Coding Sys <input type="checkbox"/>

    Cnty Analysis

**Rural-urban Environment Fields**

RUCA 2010 <input checked="" type="checkbox"/>	URIC 2010 <input checked="" type="checkbox"/>	RUCA 2000 <input checked="" type="checkbox"/>	URIC 2000 <input checked="" type="checkbox"/>
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- RUCA and URIC were in SEER\*DMS before but are new to NAACCR – format was not consistent

# New Landscape: CTC

- New fields in Overrides and Computed for Research

**Overrides**

A/S/M <input type="checkbox"/>	Sg/DC <input type="checkbox"/>	RSr <input type="checkbox"/>	S/B <input type="checkbox"/>	S/L/M <input type="checkbox"/>	SS/TM <input type="checkbox"/>	HpS#/DC <input type="checkbox"/>	HpS#/S <input type="checkbox"/>
S#/DC <input type="checkbox"/>	S/Ty <input type="checkbox"/>	IS <input type="checkbox"/>	S/E/DDt <input type="checkbox"/>	SS/NP <input type="checkbox"/>	SS/DsMt <input type="checkbox"/>	CS/Ty <input type="checkbox"/>	S/TSst <input type="checkbox"/>
S/L/S# <input type="checkbox"/>	H <input type="checkbox"/>	LeLy <input type="checkbox"/>	S/L/E <input type="checkbox"/>	SS/TN <input type="checkbox"/>	A#/CI/S# <input type="checkbox"/>	Rpt <input type="checkbox"/>	
TNM St <input type="checkbox"/>	Tis <input type="checkbox"/>	TNM 3 <input type="checkbox"/>					
Reg 1 <input type="checkbox"/>	Reg 2 <input type="checkbox"/>	Reg 3 <input type="checkbox"/>					

**Computed for Research**

SEER Site Rec <input type="checkbox"/>	ICCC Site Rec <input type="checkbox"/>	SEER Beh Recode <input type="checkbox"/>	
Surv Months <input type="checkbox"/>	Surv Flag <input type="checkbox"/>	Surv Months PA <input type="checkbox"/>	Surv Flag PA <input type="checkbox"/>
Surv DX Date <input type="checkbox"/>	Surv DOLC <input type="checkbox"/>	Surv DOLC PA <input type="checkbox"/>	
Rec# Recode <input type="checkbox"/>	SEER Cause-Specific Dth <input type="checkbox"/>	SEER Oth Cause of Dth <input type="checkbox"/>	





# New Landscape: Stage

- Staging changed a lot!
  - Switched to tab layout due to increasing number of staging systems
  - Discussing hiding tabs based on diagnosis year
  - Concerns about border years: 2017 case may become 2018 ~ Possibly show both tabs but focus based on ydx
- Adjustments already made based on comments about screens
- Additional adjustments can be made once transition to NAACCR 18 is complete in cancer community

<b>EOD/SS (2018)</b>	<i>TNM</i>	<i>CS</i>	<b>EOD/SS (old)</b>
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**Other Staging Systems**

EOD10 Size  Ext  LN  Prost

EOD2(73-82)  EOD13(73-82)  EOD4(83-87) Size  Ext  LN

<b>EOD/SS (2018)</b>	<i>TNM</i>	<b>CS</b>	<i>EOD/SS (old)</i>
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**Schema**  
Colon

**Collaborative Stage Input**

CS Size  Ext  Eval  LN  LN Eval

CS Mets  Eval  Bone  Brain  Liver  Lung  Ver Current  OR CS 20

**Site Specific Factors** [Show All SSF](#)

SSF1  **Carcinoembryonic Antigen (CEA)**

SSF3  Carcinoembryonic Antigen (CEA) Lab Value

SSF4  **Tumor Deposits**

<b>EOD/SS (2018)</b>	<b>TNM</b>	<i>CS</i>	<i>EOD/SS (old)</i>
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**Schema**  
Colon

**TNM Input**

TNM Edition#

Clinical T  N  M  Desc  Stg Grp  Stg By

Pathological T  N  M  Desc  Stg Grp  Stg By

# New Landscape: Stage 2018

- IDs tell you what schema and if AJCC eligible
- CoC Accredited drives SSDI requirements

**EOD/SS (2018)** | *TNM* | *CS* | *EOD/SS (old)*

**Schema**  
Colon and Rectum ⓘ

Reviewed  ⓘ

AJCC ID  ⓘ      Schema ID  ⓘ      CoC Accredited  ⓘ

**TNM 8th Input**

TNM Edition#  ⓘ

Clinical      T  ⓘ      Sfx  ⓘ      N  ⓘ      Sfx  ⓘ      M  ⓘ  
Stg Grp  ⓘ

Pathological      T  ⓘ      Sfx  ⓘ      N  ⓘ      Sfx  ⓘ      M  ⓘ  
Stg Grp  ⓘ

Post Therapy      T  ⓘ      Sfx  ⓘ      N  ⓘ      Sfx  ⓘ      M  ⓘ  
Stg Grp  ⓘ



# New Landscape: Stage 2018

- Additional Lymph Node fields
- EOD 2018 and SS2018

**Related Fields**

Tumor Size Clin  Path  Summary  Auto Tumor Size

Sentinel LN Pos  Sentinel LN Exm  Reg LN Dissection Dt

Reg LN Pos  Reg LN Exm  Sentinel LN Biopsy Dt    LVI

Mets:Distant LN  Bone  Brain  Liver  Lung  Other

**EOD Inputs**

EOD Prim Tumor  Reg Nodes  Mets  Prostate Pathological Extension  (*Prostate cases only*)

**Summary Stage**

Summ Stg 2018

# New Landscape: Stage 2018

- SSDIs shown based on Schema ID
- SSDIs in bold when
  - Required by SEER and you report to SEER
  - Required by CoC (RC for SEER) and CoC Accredited=1
  - Required by NPCR and you report to NPCR

## Site Specific Data Items

- CEA PreTX Lab Value
- CEA PreTX Interpretation
- Tumor Deposits
- Perineural Invasion
- Circumferential Resection Margin
- KRAS
- Microsatellite Instability (MSI)

## SEER Site Specific Factors

SEER SSF1

# New Landscape: Stage 2018

- Corrections to EOD algorithms already made based on feedback
  - No more EOD releases until 2019 – any additional errors found will be corrected later, but keep reporting!
- NPCR Derivation algorithm not yet included

## EOD Outputs

Der EOD 2018 T  N  M  Stg Grp

Der SS2018

NPCR Der AJCC 8 Clin Stg Grp  Path Stg Grp  Post Therapy Stg Grp



# New Landscape: Treatment

- Radiation overhauled by CoC, section reorganized

**Radiation**

Rs No Radtn  Radtn Seq  Start Dt    End Dt    Radtn Loc

**Diagnosed 2018+**

Num Phases Rad Tx to Vol  Discontinued Early  Total Dose

**Phase I** Tx Mod  Prim Tx Vol  Rad to Draining LN  External Beam Planning Tech   
Dose/Fraction  Num Fractions  Total Dose

**Phase II** Tx Mod  Prim Tx Vol  Rad to Draining LN  External Beam Planning Tech   
Dose/Fraction  Num Fractions  Total Dose

**Phase III** Tx Mod  Prim Tx Vol  Rad to Draining LN  External Beam Planning Tech   
Dose/Fraction  Num Fractions  Total Dose

**Diagnosed 2017 and prior**

Radtn  Radtn CNS  TX Vol  Num TX   
Reg Mod  Reg Dose  Boost Mod  Boost Dose   
Elaps Days  Compl Status  TX Intent  Ctrl Status

Radtn Beam

Radtn Oth

# Other Points of Interest



# Other Points of Interest

- Imports and Exports
  - Logic has to be adjusted for new fields
  - Logic related to PCOR, CER and State Requestor has to be double-checked and updated
- Auto-build
  - Radiation fields and TX (vs TXr) builds – old Radiation vs new Phase 1 Modality
  - Copy new fields for 2018 cases only (except Radiation)
  - Cut off old fields at 2017



# Other Points of Interest

- Polishers
  - All Year of Diagnosis based polishers updated
  - CoC Accredited Flag polisher added
  - EOD Derivations added
  - Geocoding polisher outputs revised – State, County
  - PDQ treatment verification updated to adjust for radiation changes





# Other Points of Interest

- Edits
  - SEER\*DMS edits had to be reviewed/updated
  - Jennifer to talk more about Standard Setters Edits
  - Testing through use (Thank you, Seattle – 34 edits)
  - Issues have been with edit logic, translation, and NAACCR view
  - This is part of ‘not perfect’ mentioned at the start

# High Points of Our Tour



# High Points of our Tour

- SEER\*DMS can accept the data in NAACCR 18 (18o)
- SEER\*DMS has a place to store SSDIs if you find them in text on non-NAACCR 18 records (path reports, etc)
- SEER\*DMS has lookups for EOD, Grades and TNM fields
- SEER\*DMS has ways to adjust when edits are run
  - Easily limit to 2017 and earlier
- SEER\*DMS expects to continue to be the forerunner in deployments

# Making Your Journey Easier

- 6 key SEER\*DMS staff participating in NAACCR committees
  - Edits and Staging Edits
  - XML
  - Geocoding
  - SSDI
  - Implementation Guide

# Making Your Journey Easier

- Have access to NAACCR draft, so we start defining issues before final version
  - As updates are made to draft, updates are made to issue
  - Issues requiring complex changes can be brought to development team so they can start making adjustments
    - Tabs on staging page
- Have access to edits, so we are familiar with edit logic and edits being added/updated; can pass concerns back to the committees

# Making Your Journey Easier

- SEER\*RSA development provided huge advantage
- IMS development of a SEER staging API allowed:
  - 2016: SEER\*DMS deployed 2/21/2016; NPCR deployed 10/2016
  - 2018: NPCR Derivation deployed 9/25
    - NPCR is using our SSDIs, so could NOT deploy first
    - We gave them access to beta versions and kept them updated
    - We received feedback from them that resulted in corrections

# Upcoming Destinations

- Add NPCR TNM Derivation logic
- Radiation conversion
  - Old fields to new not yet implemented
  - Radiation new fields to old still to be defined; will be applied across database
- NPCR Export: definition not yet finalized because everyone is exporting in N16 this year. But initial issue is in Squish waiting for finalized requirements
- 14 issues reported by registries not yet processed



# Enjoy Your Trip!



No, wait, that's me...



# NAACCR 2018 Implementation

## Edits

Jennifer Stevens

9/27/2018

# NAACCR 18 Edits Overview

- Number of edits increased from 965 to 1413 and counting – approximately 450 new edits
- 80+ non-SSDI data items added
- 130 SSDIs added – each SSDI has at least two inter-field edits associated with it
  - Valid value edits were combined with year of diagnosis requirements
    - Pre-2018 must be blank
    - 2018+ must be a valid value or blank
  - Schema ID requirements
    - 46 items are edited based on Coc Accredited Flag
    - Remainder are required by all facilities for the given Schema ID

# NAACCR Metafile Releases

- IMS Staff participates in the NAACCR Edits work group tasked with developing and reviewing edits for each standard setter
- Each Metafile contains edit sets owned by standard setters
- First NAACCR18 beta metafile released March 29, 2018
- Eleven beta versions reviewed prior to final release on August 23, 2018
- Version 18a is under development based on changes reported to the Edits work group and will be released within the next few weeks
- Standard setters have agreed not to add any additional edits for 2018 cases. Any new edits will only apply to 2019+. Changes to edits in the current metafile are for corrections only.



# Implementation of SEER Edit Set

- An experienced developer reviews the description and logic of the new edit in the metafile.
  - Discrepancies between logic and description are reported back to the Edits work group
- Logic is written in Groovy by an IMS developer
  - Allows code to be shared by SEER\*DMS, the SEER\*Edits standalone utility, and the edits Java library
  - Allows IMS staff to maintain and update edits as corrections arise
  - Allows edits to be released in DMS prior to release of NAACCR metafiles



# Implementation of SEER Edit Set

- IMS began writing the NAACCR18 edits as soon as the first beta metafile was released.
- New naming convention: metafile tag used as “IF” number
- The first set of NAACCR18 edits were released in DMS in ??
- Edit releases were deployed in batches as developers worked through the over 400 new edits
- Early release of edits in DMS allowed early testing of the edits and important feedback to the Edits work group



# Translated Edits in SEER\*DMS

- IMS has written a translation tool to convert the 'C-like' logic used in the metafile edits into Groovy code that can be used in DMS
- Translated edits are only updated when a new metafile is released by NAACCR
- Registries can control what edits they want to use from the translated edits. Individual edits or groups of edits can be turned on or off; or conditions can be set to control the cases to which edits are applied.