Radiation Oncology
Data Capture

What’s in STORE for you?

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A Roadmap for this Webinar

• A wee bit of radiation data history
• What is really new in STORE
• Conversion of old RT data
• More work for you?
• 5 case studies
• Loose ends
• A moment of silence and shared empathy for the job ahead
Evolution of the STORE
Comments on the Previous Slide

• Cancer registries have been around a long time (at least 120 years, maybe even 400 years) but the standardization of data sets is new, beginning when Nixon signed the National Cancer Act of 1971.

• Registry goals and data collection requirements have steadily evolved over through 5 eras from simple incidence tracking to tools for national assessment of practice patterns and outcomes.

• Over time, the amount of data requested has grown seven-fold, from about 30 fields in the 1980’s to over 210 fields in the STORE.

• As with other evolutionary processes, some data items have thrived for a period only to become extinct. New fields have evolved and many will struggle against an ever changing climate of cancer treatment.
RT Data Collection Has Evolved as Well

❖ SEER ca. 1982: 1 Field - Radiation Therapy – Yes/No

❖ CoC before 1988 (The “Yellow Book”)
  • 1 Field “Radiation Therapy”, 9 items

❖ DAM 1988: Three fields:
  • Radiation Therapy
  • Radiation Therapy to Brain
  • Radiation/Surgery Sequence
Comments

• SEER and CoC data sets of the 1980’s were basically designed to monitor incidence with minimal treatment data.

• The CoC’s “Yellow Book” was little more than an 8 ½ x 11 stapled booklet of perhaps 30 pages with coding recommendations for about that many fields.*

• The CoC Radiation Therapy field shown persisted through DAM and ROADS and has been proven to be very useful for queries and reporting. It persists in OncoLog today, unchanged.

• The Radiation Therapy to Brain field was added in the DAM because of great interest in determining if and when prophylactic whole brain radiation benefited lung cancer patients.

*Sadly, my copy of the “Yellow Book” has been lost. If anyone has a copy please contact twilliamson@oncolog.com.
Radiation Therapy Data Collection Then:

❖ ROADS 1996 *(15 Fields)
• Date Radiation Started Radiation Therapy
• Radiation Therapy
• Radiation Therapy at this Facility
• Location of Radiation Treatment (7 items)
• Radiation Treatment Volume (46 items, 222 RV codes in OL)
• Regional Treatment Modality (31 items)
• Regional Dose (cGy)
• Number of Treatments to This Volume
• Elapsed Treatment Time (Days)
• Radiation /Surgery Sequence (8 items)
• Radiation to CNS (historical data only)
• Intent of Treatment
• Radiation Treatment Completion Status
• Radiation Therapy Local Control Status
• Reason for No Radiation (8 items)

*This data set was developed from a more comprehensive radiation database developed at Salem Health by Onco staff. Adopted by CoC with permission.
Comments

• The ROADS was the first data set to take radiation oncology seriously, in part because the ROADS task force organized by the CoC was the first such group to have active participation of a radiation oncologist.

• Many of the fields lasted only through the ROADS epoch (text in red) only to be driven to extinction because they failed to contribute useful information or were difficult to collect.

• “Radiation Therapy at this Facility” was an ill-conceived attempt by the committee to synchronize RT collection with Surgery, Chemo, etc. It was redundant to the field “Location...”
Radiation Therapy Data Collection Then:

❖ ROADS (1996)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COC</th>
<th>SEER</th>
<th>NPCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date radiation started</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation at this facility</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Regional dose: cGy</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Number of treatments to this volume</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation elapsed treatment time (days)</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation treatment volume</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Location of radiation treatment</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Intent of treatment (radiation)</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Regional treatment modality</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation therapy to CNS</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation/surgery sequence</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation treatment completion status</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Radiation therapy local control status</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Reason for no radiation</td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

R = Required, S = Supplementary ("recommended"), O = Optional
• In OncoLog, the lavender Treatment Volume field used proprietary RV codes

• Fields highlighted in gray proved difficult to collect since they were not always documented in the chart.

• Fields highlighted in red were not very useful:
  • Elapsed treatment time could be computed from radiation start and finish dates.
  • By the late 1990’s we had a pretty good handle on when to treat the brain prophylactically in lung cases.

• More importantly, the yellow highlight shows that none of these fields were considered to be “required”

• Instead of using the ROADS coding for Volume Treated OncoLog kept its historic “RV” code system (ca. 1986) which provided greater detail for reporting. For data exported to central registries the RV codes were “dumbed-down” to CoC codes.
Radiation Therapy Data Collection Then:

❖ FORDS 2003 (11 Fields)
  • Date Radiation Started (with “Flag”)
  • Location of Radiation Treatment (7 items)
  • Radiation Treatment Volume (46 items, 222 RV codes in OL)
  • Regional Treatment Modality (31 items)
  • Regional Dose
  • Boost Treatment Modality (31 items)
  • Boost Dose
  • Number of Treatments to This Volume
  • Radiation/Surgery Sequence (8 items)
  • Date Radiation Ended (with “Flag”)
  • Reason for No Radiation (8 items)
  • Radiation Therapy (CoC) – OncoLog only
Comments

• The FORDS data committee, which now had two radiation oncologists* and six surgeons, successfully simplified (dropping 7 fields**) and enhanced (three new fields) the data set with a more complete description of treatment, adding “Boost” data to the Regional data collected in ROADS.

• All FORDS RT fields were required.

• The classic Yellow Book “Radiation Therapy” field was dropped by CoC but, because of its utility it was retained in OncoLog under the name “Radiation Therapy (CoC). In the STORE it has been re-named again and is now “Summary for Filtering”

*Including the ROADS rad onc
**Including “Radiation Therapy”
• In planning for the STORE, the CoC team recognized that since these fields were last reviewed in 2002 there have been significant changes in RT technology. With came an increase in complexity that is not well matched to the 1996 data set but important to outcomes and cost of care.

• Wisely, they recruited a small group of academic rad onc's to form a committee to review the FORDS and propose updates and changes.

• As work progressed the CoC asked Onco’s medical director to join the committee, review the recommendations, and assist in designing rules for converting historic (ROADS/FORDS) data.
Phases – (New?)

**STORE**

Radiation Therapy

The radiation items in STORE are clinically relevant and reflect contemporary practice. These items record new “phase” terminology, replacing the traditional terms of “regional” and “boost.” The first phase (Phase I) of a radiation treatment may be commonly referred to as an initial plan and a subsequent phase (Phase II) may be referred to as a boost or cone down. A new phase begins when there is a change in the target volume of a body site, treatment fraction size, modality or treatment technique. Up to three phases of radiation treatment can now be documented.

**FORDS**

Rationale

Radiation treatment is frequently delivered in two or more phases which can be summarized as “regional” and “boost” treatments. To evaluate patterns of radiation oncology care, it is necessary to know which radiation resources were employed in the delivery of therapy. For outcomes analysis, the modalities used for each of these phases can be very important.
Comments

• Technically, radiation therapy to a target volume has always been delivered in one or more “phases”. Here the term phase refers to one or more consecutive treatments in which the treatment parameters are constant.

• For very practical reasons (cost of data collection, registrar workload, value of the data) it has never been possible to collect all phase data for all treatment situations.

• The ROADS supported 1 phase.
• The FORDS supported 2 phases.
• The STORE and NAACCR18 collect up to three phases.
Phase: The STORE Definition

- “A new phase begins when there is a change in target volume, treatment fraction size (i.e., dose given during a session), modality, or treatment technique.” (STORE 2018A, pg 34)
- “Any one of these changes will mean that a new radiation plan will be generated in the treatment planning system.” (STORE 2018A, pg 277)
- In the FORDS you were told to document the phase treating the largest volume around the target as “Regional” treatment and aggregate data for all other phases as “Boost” treatment. The FORDS data has no information about the order in which these components were treated. STORE phases are chronological.
New Radiation Fields in STORE

Phase Data*
- Treatment Volume
- Radiation to Nodes
- Treatment Modality
- Planning Technique
- Dose Per Fraction
- Number of Fractions
- Total Dose

Summary Data
- Total Dose for Course
- Discontinued Early?
- Number of Phases

*Up to 3 phases can be reported to NCDB and central registries.
STORE Fields Carried Over From FORDS

Summary Data

• Date Treatment Started
• Date Treatment Ended
• Location of Treatment
• Radiation Therapy (CoC)*

*OncoLog only
Data Conversion FORDS > STORE
What About Your FORDS Data?

- The radiation committee is recommending to vendor/developers that all historic data fields be preserved intact somewhere in the registry:
  - To validate conversion
  - To facilitate correction of any conversion problems
  - As a historic reference
- To the extent possible, all historic data will be converted to the new coding. These new fields will be populated with data for all cases in your registry.
- The CoC has declared that, going forward, there will be no edits applied to pre-2018 radiation data.
FORDS to STORE
Just a Bit of Re-structuring

**FORDS**
- Radiation Treatment Volume (46 codes)
- Treatment Modality (31 codes)

**STORE**
- Radiation Primary Treatment Volume (69 codes)
- Radiation to Draining Lymph Nodes (9 codes)
- Radiation Treatment Modality (21 codes)
- Radiation External Beam Planning Technique (21 codes)
Comments

• Volume and Nodes:
  • With the Radiation Volume field of the FORDS the treatment of lymph nodes was implicit. If you treated the pelvis you were obviously treating pelvic lymph nodes.
  • The STORE separates these targets into two fields and provides finer detail at certain sites.
  • OncoLog’s RV codes documented both elements in much greater detail.

• Modality and Planning
  • The FORDS Treatment Modality field focused on equipment but also provided some detail on planning techniques.
  • STORE separates modality and planning technique.
Two Basic Clinical Settings for Volume Conversion

1) The primary target has an ICD-O site code in the range C00.0 - C76.8 or is unknown, C80.9.
   
   **Volume codes 10 – 98**
   **Nodes Codes 00 - 09**

2) The primary target is in the lymphatic system (lymphoma originating in lymph nodes) C77.0 – C77.9.
   
   **Volume Codes 01 – 09**
   **Nodes Code 88**
Comments

• It is important to emphasize that the coding rules described in item 2 apply only to lymphomas originating at a lymph node site.

• For example, a primary lymphoma of the breast would most likely have a volume code of 40 or 41 (Breast-whole or Breast-partial) and a Nodes code of 00 (unless there was an indication to treat regional lymph nodes).

• We will not get into the debate as to whether a primary lymphoma of the breast originated in an intramammary lymph node.
Mapping the Data
Comments

It looks complicated but there are patterns:

• Every FORDS Volume has somewhere to go on the right (STORE Volume)
• Yellow STORE CODES are new, white have been carried over, green are now obsolete but have historical relevance.
• Some FORDS Volumes also go to the left (STORE Nodes). Some of these are obvious (19, 21 35…) and many are driven by clinical realities (5, 12, 13…).
• Parallel sets of rays indicate FORDS volume codes retained in STORE.
• Dashed rays come from FORDS codes that have been split into 2 or more sub-volumes (the conversion uses site codes).
• “Orphan” STORE codes like 65 (Partial Prostate) or 01-05 (nodes) are new and have no equivalent in FORDS.
• Every FORDS Modality has unique companions in STORE Modality and Planning.
  • Green STORE codes identify new technologies that were not available when FORDS was designed.
  • Again, parallel rays occur when FORDS categories are reproduced in STORE
  • Rays converging from FORDS to STORE confess a loss of specificity.
  • Note that all FORDS brachytherapy codes converge to a STORE planning code of 98 (Not Applicable). This does not mean that such treatments do not involve planning. To the contrary, they often involve two planning efforts; a plan for what we would like to achieve and, after the implant, an image-based plan based on where the seeds, needles, capsules, etc. actually landed.
Is There More Work in STORE For You?
Comments

CTR

• Do you suffer from STORE anxiety?
• Do current events in the registry world give you flashbacks to 2002?
• Does the idea of 31 fields just for radiation therapy send you into dreams of retirement?

IF SO

• The following two slides may give you a tiny bit of reassurance.
Radiation Treatment Demographics*

*Very approximate

First Course Radiation for Every 100 New Cases

- No Radiation: 70
- Treated: 30
- One Phase Only: 15
- Two Phases: 12
- Three Phases: 2
- More than Three: 1

*Very approximate
To begin with:

- You are responsible only for first course radiation treatments.
- In today’s practice only about 30% of cancer patients are treated with radiation in the first course.
- Of those, about half have just one phase of treatment (15% of all cases).
- Of the remaining 15% most will have just two phases.
- Less than 5% will have three phases.
- In most settings more than three phases is rare, probably less than 1% of all patients diagnosed.
Required Default Radiation Values with No Treatment*
(Yes, there is redundancy)

- Date Radiation Started Flag (11)
- Phase I Radiation Volume (00)
- Number of Phases of Radiation...(00)
- Reason for No Radiation (as appropriate)

*Radiation Committee recommendation, not yet addressed in STORE.
Radiation Field Workload
Then and Now

<table>
<thead>
<tr>
<th>Radiation Treatment</th>
<th>DAM</th>
<th>ROADS</th>
<th>FORDS</th>
<th>STORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>3</td>
<td>14</td>
<td>11</td>
<td>4.5</td>
</tr>
<tr>
<td>One Phase</td>
<td>3</td>
<td>14</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Two Phases</td>
<td>3</td>
<td>14</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>Three Phases</td>
<td>3</td>
<td>14</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>More than 3 Phases</td>
<td>3</td>
<td>14</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>Percent New Cases Treated</td>
<td>50%</td>
<td>50%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Average per New Diagnosis</td>
<td>3</td>
<td>14</td>
<td>11.8</td>
<td>9.51</td>
</tr>
</tbody>
</table>
Comments

- DAM: 3 fields coded on every case, treated or not.
- ROADS: If you weren’t taking your O-C medicine you might be coding 14 fields on every case, but you could get away with just 2.
- FORDS: Since 2002 you have been obliged to code a minimum of 11 fields, treated or not. STORE: 70% of cases need only 4.5 fields coded which shifts the workload a bit in your favor.
- 4.5 fields? We are sharing responsibility with the surgical data set.

We admit, this may be a bit optimistic, but we sincerely hope it is not too far off the mark. TW
Screens and Fields for Radiation Therapy

<table>
<thead>
<tr>
<th>Phase</th>
<th>Treatment Volume</th>
<th>Radiation to Nodes</th>
<th>Treatment Modality</th>
<th>Planning Technique</th>
<th>Number of Fractions</th>
<th>Total Dose for Phase</th>
<th>Average Dose Per Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>77 Lumen or cervix</td>
<td>06 Skull lymph nodes</td>
<td>01 External beam, NOS</td>
<td>01 External beam, NOS</td>
<td>50</td>
<td>4500</td>
<td>9999</td>
</tr>
<tr>
<td>2</td>
<td>77 Lumen or cervix</td>
<td>Radiation to Nodes</td>
<td>Treatment Modality</td>
<td>Planning Technique</td>
<td>Number of Fractions</td>
<td>Total Dose for Phase</td>
<td>Average Dose Per Fraction</td>
</tr>
<tr>
<td>3</td>
<td>00 No radiation treatment</td>
<td>Radiation to Nodes</td>
<td>Treatment Modality</td>
<td>Planning Technique</td>
<td>Number of Fractions</td>
<td>Total Dose for Phase</td>
<td>Average Dose Per Fraction</td>
</tr>
<tr>
<td>4</td>
<td>Treatment Volume</td>
<td>Radiation to Nodes</td>
<td>Treatment Modality</td>
<td>Planning Technique</td>
<td>Number of Fractions</td>
<td>Total Dose for Phase</td>
<td>Average Dose Per Fraction</td>
</tr>
</tbody>
</table>

Supplemental/Custom Information

<table>
<thead>
<tr>
<th>Radiation Treatment Volume</th>
<th>Treatment Technique Target Volume</th>
<th>Treatment Volume Latest</th>
<th>Regional Treatment Modality</th>
<th>Electron Beam Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/05 - Pelvis with Boost, NOS - 29</td>
<td>Boost Volume Technique</td>
<td>Boost Treatment Modality</td>
<td>Boost Electron Energy</td>
<td>Boost Dose - cGy</td>
</tr>
<tr>
<td>4200</td>
<td></td>
<td></td>
<td></td>
<td>9999</td>
</tr>
</tbody>
</table>
Gateway Screen is Almost Unchanged

Two NCDB Required Fields
Comments

By the arrows:

- Radiation/Surgery Sequence: Born in the DAM and always required.
- Reason for No Radiation: First appeared in ROADS and lives on as a required field.
- Beam Comments: Born in California around 1990, migrated into the NAACCR record in 1996. May be required by some central registries (for data quality control)
- Note that the Facility check box is missing. It was created for ROADS to mimic coding rules for other modalities but never really made sense. The Location of Radiation field does the job.
Big Changes in the Details

1. Treatment Details
   - Location(s) of Treatment: C1 At Radiation Treatment At This Facility
   - Total Dose to Volume: 399988
   - Discontinued Early:
   - Date Started: 05/02/2015
   - Date Completed: 06/15/2016
   - Number of Phases: 2 phases
   - Summary for Filtering: 04 Beam Radiation + Implants 01 Isotopes

2. Phases
   - Phase 1
     - Treatment Volume: 71 Uterus or cervix
     - Radiation to Nodes: 06 Pelvic lymph nodes
     - Treatment Modality: 01 External beam, NOS
     - Planning Technique: 01 External beam, NOS
     - Number of Fractions: 30
     - Total Dose for Phase 1: 45000
     - Average Dose Per Fraction: 99999
   - Phase 2
     - Treatment Volume: 71 Uterus or cervix
     - Radiation to Nodes: 99 Unknown if any radiation to draining lymph nodes
     - Treatment Modality: 09 Brachytherapy, intracavitary, HDR
     - Planning Technique: 88 Not applicable
     - Number of Fractions: 999
     - Total Dose for Phase 2: 999988
     - Average Dose Per Fraction: 99999
   - Phase 3
     - Treatment Volume: 00 No radiation treatment
     - Radiation to Nodes:
     - Treatment Modality:
     - Planning Technique:
     - Number of Fractions:
     - Total Dose for Phase 3:
     - Average Dose Per Fraction:
   - Phase 4
     - Treatment Volume:
     - Radiation to Nodes:
     - Treatment Modality:
     - Planning Technique:
     - Number of Fractions:
     - Total Dose for Phase 4:
     - Average Dose Per Fraction:

3. Supplemental/Custom Information
   - Radiation Treatment Volume: RV345 - Pelvis with Boost, NOS - 29
   - Regional Dose - cGy: 4500
   - Boost Treatment Modality: 52 - Brachytherapy, intracavitary, HDR
   - Boost Electron Energy: 20 - External beam, NOS
   - Boost Dose - cGy: 9999

4. Options
   - Okay
   - Cancel
Comments

By the number:

1. Summary STORE and Onco data: STORE fields are required for any case receiving radiation therapy.
2. Phase data, STORE describes 3 phases, OncoLog provides 4. Why?
   1. It gives you the option of a full description for those rare cases that are treated with 4 phases, OR, you can just ignore the 4th phase.
   2. Frankly, we also did it because it balanced the screen.
   3. Of course, anything you code in the 4th phase will never be reported to NCDB or your state registry.
3. Supplemental data: Here you will find any supplemental fields you had created plus the pre-2018 radiation fields that were moved or converted for the STORE.
## Block 1: Summary Data – 7 Required

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Location(s) of Treatment</th>
<th>Date Started</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>All Radiation Treatment At This Facility</td>
<td>05/02/2016</td>
<td>06/15/2016</td>
</tr>
<tr>
<td>Phase 2</td>
<td>All Radiation Treatment At This Facility</td>
<td>05/02/2016</td>
<td>06/15/2016</td>
</tr>
</tbody>
</table>

### Radiation Treatment

<table>
<thead>
<tr>
<th>Volume</th>
<th>Rad Onc</th>
<th>CCFA, Kathleen L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rad Onc</td>
<td>CCFA, Kathleen L</td>
</tr>
</tbody>
</table>

### General Information

<table>
<thead>
<tr>
<th>Total Dose to Volume</th>
<th>999998</th>
</tr>
</thead>
</table>

### Additional Information

- **Rad Onc:** CCFA, Kathleen L
- **Phase 1 Fac:** Teach Hospital - 2
- **Phase 2 Fac:** Teach Hospital - 7
- **Number of Phases:** 2 phases
- **Summary for Filtering:** 04 Beam Radiation + Implants Or Isotopes
- **Treatment Volume:** 71 Uterus or cervix
- **Radiation to Nodes:** 06 Pelvic lymph nodes
- **Treatment Modality:** 01 External beam, NOS
By the Arrows:

- **Volume #:** An Onco field, not required but important if you have the time and energy to record data for more than one volume.
- **Rad Onc:** Same as Physician #3 as recommended in ROADS/FORDS/STORE.
- **Phase 1 Fac:** Identifies the facility initiating treatment with radiation. Onco field, not required but extremely useful in understanding patient migration patterns.
- **Phase 2 Fac:** New Onco field. For the occasional patient whose first course treatment is started at one facility and completed at another.
- **Summary For Filtering:** Survivor from Yellow Book, we used to call it Radiation Therapy (CoC).
Block 2 – Phase Data

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment Volume</strong></td>
<td>71 Uterus or cervix</td>
</tr>
<tr>
<td><strong>Radiation to Nodes</strong></td>
<td>06 Pelvic lymph nodes</td>
</tr>
<tr>
<td><strong>Treatment Modality</strong></td>
<td>01 External beam, NOS</td>
</tr>
<tr>
<td><strong>Planning Technique</strong></td>
<td>01 External beam, NOS</td>
</tr>
<tr>
<td><strong>Number of Fractions</strong></td>
<td>30</td>
</tr>
<tr>
<td><strong>Total Dose for Phase 1</strong></td>
<td>4500</td>
</tr>
<tr>
<td><strong>Average Dose Per Fraction</strong></td>
<td>99999</td>
</tr>
</tbody>
</table>

**Phase 1 Details**

- **Location(s) of Treatment**: All Radiation Treatment At This Facility
- **Date Started**: 05/02/2016
- **Completed**: 06/15/2016
- **Number of Phases**: 2 phases
- **Summary for Filtering**: 04 Beam Radiation + Implants Or Isotopes

**Phase 2 Details**

- **Location(s) of Treatment**: All Radiation Treatment At This Facility
- **Date Started**: 05/02/2016
- **Completed**: 06/15/2016
- **Number of Phases**: 2 phases
- **Summary for Filtering**: 04 Beam Radiation + Implants Or Isotopes
All phase blocks are configured exactly the same, in roughly the order you might expect in the oncologists treatment summary letter.

In the STORE the number representing doses and number of fractions has leading 0’s. In OncoLog you don’t need them. They are stored as the integer numbers they represent. The leading 0’s are added when your data is mapped to the STORE record. Thus 180 becomes 00180 and 4500 becomes 04500.

Dose Per Fraction is 99999 because this is a converted case and FORDS did not collect this data.

Note that you can click on the button to calculate the fractional dose. In this example the 99999 would become 150.
### Block Three – Supplemental & Historic

#### Radiation

<table>
<thead>
<tr>
<th>Treatment</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location(s) of Treatment</td>
<td>All Radiation Treatment At This Facility</td>
</tr>
<tr>
<td>Total Dose to Volume</td>
<td>99999</td>
</tr>
<tr>
<td>Discontinued Early</td>
<td></td>
</tr>
<tr>
<td>Date Started</td>
<td>05/02/2016</td>
</tr>
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<td>06/15/2016</td>
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<td>2 phases</td>
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<td>Summary for Filtering</td>
<td>04 Beam Radiation + Implants Or Isotopes</td>
</tr>
</tbody>
</table>

**Phase 1**
- Treatment Volume: Uterus or cervix
- Radiation to Nodes: Pelvic lymph nodes
- Treatment Modality: External beam, NOS
- Planning Technique: External beam, NOS
- Number of Fractions: 30
- Total Dose for Phase 1: 4500
- Average Dose Per Fraction: 99999

**Phase 2**
- Treatment Volume: Uterus or cervix
- Radiation to Nodes: Unknown if any radiation to draining lymph nodes
- Treatment Modality: Brachytherapy, intracavitary, HDR
- Planning Technique: Not applicable
- Number of Fractions: 999
- Total Dose for Phase 2: 99998
- Average Dose Per Fraction: 9999

---

### Supplemental/Custom Information

| Radiation Treatment Volume | RV945 - Pelvis with Boost, NOS - 29 |
| Treatment Technique This Volume | |
| Treatment Volume Laterality | 20 - External beam, NOS |
| Regional Treatment Modality | 20 - External beam, NOS |
| Electron Beam Energy | |

| Regional Dose - cGy | 4500 |
| Boost Volume Technique | |
| Boost Treatment Modality | 52 - Brachytherapy, Intracavitary, HDR |
| Boost Electron Energy | |
| Boost Dose - cGy | 9999 |
• The supplemental block will contain any supplemental RT fields you might have created in the past but it will now also include all of the FORDS fields and their data for pre-2018 case.
No Radiation Treatment
Case # 1 – No Treatment

4 ½ Fields Required
Required fields shown here are the committee’s recommendations – not necessarily an edits reality. Redundancy of the message was their decision.

Rad/Surg Sequence from DAM era. Surgery takes half credit on the “required” thing.

Reason No Rad – the only one that requires thought and investigation

Date flag (11), embedded in date field, Onco-style

Number of Phases(0)

Phase 1 Volume (00)
#2 One Phase Treated Case Study
Case #2

- 78 y/o female with new diagnosis multiple myeloma
- R hip pain
- Lytic lesion, threatening fracture
- Treated using opposed conformal 15Mv photons
- 5 fractions at 400 cGy per day - 4/5/18 to 4/9/18
- Chemo started on completion of treatment
Comments

You should find the terminology FORDS-familiar, the data is just distributed in an alternate manner.

• Only the doctor is required in the top row but all fields can add value to your data.

• Location serves the same function as the facility/summary check boxes for other modalities of treatment.

• Look closely at the summary letter for planning technique. Palliative treatment is often done with 2D planning but a hip may be conformal.

• Always set Volume to 00 for the first unused phase.
CASE Study

#3 Two Phases Treated
Healthy 69 y/o man with Gleason 9, cT1c prostate Ca. Treated with iodine seed implant (2/21/2018) at a Teach Hosp 1 followed by 4-field conformal pelvic radiation with 15Mv photons (3/5/2018 to 4/6/2018, 4500cGy in 25 fractions) at your facility (Teach Hosp 7).
Comments

• This ROADS era field covers the Facility/Summary issue.
• Total Dose: Code 999998 whenever there is brachytherapy. There is no general agreement on how to quantify a brachy dose.
• Modality: Iodine is low dose-rate interstitial.
• Planning Technique: 88 even though there is planning.
• Brachy phase doses are 99998, one digit shorter.
• Regional treatment goes to phase 2, the order in which it was given.
• Code Radiation to Nodes to 06 Pelvic
• Code unused Phase 3 Volume to 00.
**Case # 3A Treated Before 1/1/2018**

(Converted)

Healthy 69 y/o man with Gleason 9, cT1c prostate Ca. Treated with iodine seed implant (10/19/2017) at a Teach Hosp 1 followed by 4-field conformal pelvic radiation with 15Mv photons (11/6/2017 to 12/8/2017, 4500cGy in 25 fractions) at your facility (Teach Hosp 7).

<table>
<thead>
<tr>
<th>Radiation Therapy</th>
<th>Surgery Seq</th>
<th>00 No Radiation And/Or Ca-Directed Surgery</th>
<th>Reason No Rad</th>
<th>00 Radiation was administered</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Volume #</th>
<th>1</th>
<th>02 Regional Treatment At This Facility; Boost Elsewhere</th>
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</thead>
<tbody>
<tr>
<td>Total Dose to Volume</td>
<td>999998</td>
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</tr>
<tr>
<td>Discontinued Early</td>
<td>01 Radiation treatment completed as prescribed</td>
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</tr>
</tbody>
</table>

### Treatment 1
- **Treatment Volume**: 64 Prostate - whole
- **Radiation to Nodes**: 06 Pelvic lymph nodes
- **Treatment Modality**: 02 External beam, photons
- **Planning Technique**: 04 Conformal or 3D conformal therapy
- **Number of Fractions**: 25
- **Total Dose for Phase 1**: 4500
- **Average Dose Per Fraction**: 99998

### Treatment 2
- **Treatment Volume**: 64 Prostate - whole
- **Radiation to Nodes**: 00 No radiation treatment to draining lymph nodes
- **Treatment Modality**: 10 Brachytherapy, interstitial, LDR
- **Planning Technique**: 88 Not applicable
- **Number of Fractions**: 1
- **Total Dose for Phase 2**: 99998
- **Average Dose Per Fraction**: 99998

### Treatment 3
- **Treatment Volume**: 00 No radiation treatment

### Treatment 4
- **Treatment Volume**: 00 No radiation treatment
Comments

Same situation but a 2017 case – converted

- Only the facility giving regional treatment is identified.
- Phase 2 facility is blank
- Regional treatment is in Phase 1 because FORDS did not document the order of delivery of regional and boost treatment.
- Phase 2 documents boost treatment.

In the big picture, this oddity has little significance for downstream patterns of care and outcomes studies.
Case Study #4

Three Phases Treated
# 4 Three Phases Treated

76 y/o man with T3b prostate ca receives whole pelvis RT to 4500 cGy in 25 fractions of 180 cGy (7/9/2018 to 8/10/2018) followed by an IMRT boost of 19 fractions in which the seminal vesicles receive an additional 3420 cGy while the prostate receives 3800 cGy (8/13/2018 to 9/7/2018).
76 y/o man with T3b prostate ca receives whole pelvis RT to 4500 cGy in 25 fractions of 180 cGy (7/9/2018 to 8/10/2018) followed by an IMRT boost of 19 fractions in which the seminal vesicles receive an additional 3420 cGy while the prostate receives 3800 cGy (8/13/2018 to 9/7/2018).
#4 Phase 2

76 y/o man with T3b prostate ca receives whole pelvis RT to 4500 cGy in 25 fractions of 180 cGy (7/9/2018 to 8/10/2018) followed by an IMRT boost of 19 fractions in which the seminal vesicles receive an additional 3420 cGy while the prostate receives 3800 cGy (8/13/2018 to 9/7/2018).
# 4 Three Phases Treated

76 y/o man with T3b prostate ca receives whole pelvis RT to 4500 cGy in 25 fractions of 180 cGy (7/9/2018 to 8/10/2018) followed by an IMRT boost of 19 fractions in which the seminal vesicles receive an additional 3420 cGy while the prostate receives 3800 cGy (8/13/2018 to 9/7/2018).
Comments

• Phase 1 is easy since only one thing is going on. After that it gets debatable.

• We chose to focus on the prostate itself for describing phase 2

• That left the seminal vesicles for phase 3

• Could have just as reasonably reversed the order of phases 2 and 3 since the use of IMRT allowed prostate and seminal vesicles to be treated concurrently at different daily fraction sizes.

• No good answer. Maybe the committee will set standards.
#5 AN ENIGMA CASE STUDY
# 5 How Many Phases?

• **Diagnosis:** 46 y/o female with T2N1M0 breast cancer, and conservation surgery. 3 of 5 nodes positive. ER 100%, PR 10%, Her-2 Negative.

• **Treatment:**
  • Whole breast RT, 5040 cGy in 28 fractions given between 8/13/2018 and 9/19/2018 using 6Mv photons, conformal.
  • Axillary and supraclav nodes treated concurrently with 6Mv photons, an anterior field covering both regions and a posterior field added to the axilla. The record shows that the SC received 4500cGy* at a depth of 3 cm and the midplane of the axilla received 5040cGy.
  • Between 9/20/2018 and 9/26/2018 the surgical bed received an electron boost of 1000cGy in 5 fractions.

*The medial portion of the anterior field was blocked for the last three treatments (540cGy) to minimize the risk of brachial plexus injury.*
#5A Literal Interpretation of Phase

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<th>Location(s) of Treatment</th>
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<tbody>
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<tr>
<td>Discontinued Early</td>
<td>01 Radiation treatment completed as prescribed</td>
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<tr>
<td>Date Started</td>
<td>08/13/2018</td>
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<tr>
<td>Completed</td>
<td>09/26/2018</td>
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<tr>
<td>Number of Phases</td>
<td>4 phases</td>
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<tr>
<td>Summary for Filtering</td>
<td>01 Beam Radiation</td>
</tr>
</tbody>
</table>

**Phase 1**
- **Treatment Volume**: 40 Breast - whole
- **Radiation to Nodes**: 00 No radiation treatment to draining lymph nodes
- **Treatment Modality**: 02 External beam, photons
- **Planning Technique**: 04 Conformal or 3-D conformal therapy
- **Number of Fractions**: 28
- **Total Dose for Phase 1**: 5040
- **Dose Per Fraction**: 180

**Phase 2**
- **Treatment Volume**: 04 Breast/chestwall lymph node regions
- **Radiation to Nodes**: 88 Not applicable; Phase 2 Radiation Primary Treatment
- **Treatment Modality**: 02 External beam, photons
- **Planning Technique**: 04 Conformal or 3-D conformal therapy
- **Number of Fractions**: 25
- **Total Dose for Phase 2**: 4500
- **Dose Per Fraction**: 180

**Phase 3**
- **Treatment Volume**: 04 Breast/chestwall lymph node regions
- **Radiation to Nodes**: 88 Not applicable; Phase 3 Radiation Primary Treatment
- **Treatment Modality**: 02 External beam, photons
- **Planning Technique**: 04 Conformal or 3-D conformal therapy
- **Number of Fractions**: 3
- **Total Dose for Phase 3**: 540
- **Dose Per Fraction**: 180

**Phase 4**
- **Treatment Volume**: 41 Breast - partial
- **Radiation to Nodes**: 00 No radiation treatment to draining lymph nodes
- **Treatment Modality**: 02 External beam, photons
- **Planning Technique**: 04 Conformal or 3-D conformal therapy
- **Number of Fractions**: 5
- **Total Dose for Phase 4**: 1000
- **Dose Per Fraction**: 200
Comments

Phase 1: Whole breast, Code 40 ignores the fact that a typical whole breast field catches axillary tail nodes.

Phase 2: Supraclavicular and axillary nodes. Nodes code is not very specific.

Phase 3: Anterior field shape changes – new phase – axilla given another 540 cGy.

Phase 4: The boost – lost to posterity. Phase 4 never gets reported.
A Practical Interpretation of Phase
Comments

Phase 1: Same as before

Phase 2: Supraclav and Axilla – different volume – separate phase. Ignore the 540 cGy dose difference. Chron order maintained.

Phase 3: Boost. Preserved. Is anything really lost here for analysis?

Phase 4: You can leave it blank.
Phase 1: We consider the breast-supraclav-axilla complex to be one volume and code the Nodes field, ignoring the 540cGy deficit to supraclav.

Phase 2: The boost

Phase 3: The required default 00

- For the future analyst, has anything been lost? We don’t think so.
- We will see what is finally published.
When There are Four or More Phases

• Detail the first three, ignore the rest but record the actual total number of phases.

• Currently the STORE limits the “Number of Phases” field to “4 or more”. We expect that to change. OncoLog lets you report a phase count of up to 9 (a ridiculously large number, we hope!).

• Of course, with OncoLog, you have the option of documenting details for a fourth phase if you wish.
Some Questions from the OncoLog Family

• How would you code concurrent radiation to the prostate and spine in a patient that presents at diagnosis with advanced local disease and bone metastases?

• How do you enter phases if a person has rad to humerus and the femur for bone metastases.

• How do you enter phases for head and neck where they receive RT to primary site and both sides of the neck, all different amounts. For example, Tonsil 6996 CGY, right neck 6100 CGY, left neck 5400 CGY.
When There Are Two or More Distinct Anatomic Volumes Treated Concurrently:

• STORE offers no guidance at this point.
• FORDS says:
  • “Identifies the volume or anatomic target (singular) of the most clinically significant radiation therapy delivered...”
  • “If two discrete volumes are treated and one of those includes the primary site, record the treatment to the primary site.”
• A committee is still working to resolve these and other questions.
Unresolved RT Coding Issues

• Simultaneous treatment to multiple sites of the body: Should treatment to each body site be summarized as distinct phases? What if there are more volumes than phases? How do you prioritize?

• If there are insufficient phases to describe a course of treatment will we simply truncate coding at phase 3 or try to aggregate phases 3-N?

• Will radiation field edits conform to the radiation committee’s proposed default rules?

• If secondary volumes are to be coded, will it be restricted to the oligometastatic setting?

• Simultaneous integrated boost: Should each volume/fractionation combination summarized as a separate phase?

• How do you code on-line or off-line adaptive planning techniques?
Until We Have a Formal Policy From CoC:

- Your safest policy for now: Multiple phases in a radiation treatment summary will imply sequential treatments to a single site in the body. Select the coded volume by FORDS rules until CoC/STORE clarifies the rules.
# Coding Modality for “Heavy Equipment”

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<th>Product</th>
<th>Modality</th>
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<td>03, 04, 05, 09, 10</td>
</tr>
<tr>
<td>Elekta MRI-Linac</td>
<td>02</td>
<td>03, 04, 05, 09, 11</td>
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<tr>
<td>Varian TrueBeam STX with Novalis</td>
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<td>03, 04, 05, 08</td>
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<td>Varian Halcyon</td>
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<td>06</td>
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<td>05, 06</td>
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<tr>
<td>Accuboot (NIBB)</td>
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</table>

Many thanks to Wilson Apollo, MS, CTR, RTT, for sharing his heavy equipment research.
MOMENT OF SILENCE

FOR ALL THE CTR’S WHO WILL HAVE TORN THEIR HAIR OUT BEFORE 2018 ABSTRACTING IS COMPLETE
Hey CTR’s

It’s Catch Up Time