



# MROQC Physics Training

Contents:	Page
- About MROQC Physics	3
- Projects	4
- Uploading Survey Data	5
- Uploading DICOM Data	5
- Power BI Reports	9
- How to Complete Training	13
- Appendix: Physics Tip Sheet	14

## About MROQC Physics

Welcome to MROQC! Our goal is to ensure the physics data that is being uploaded is of high quality. This document will introduce each of the projects MROQC has and elaborate on what is required for each. We will also provide information about the site reports relevant to physics data and quality measures. As you become familiar with using the databases, this document can also serve as a reference. Additional resources, including brief videos covering the same content, can be found here <https://www.mroqc.org/physics-resources>.

### **Important Links:**

MROQC Website: [www.mroqc.org](http://www.mroqc.org)

Database access and instructions: <https://www.mroqc.org/access-instructions>

Incentive program resources: <https://www.mroqc.org/bcbsm-incentive-programs>

Facility Performance Report: <https://www.mroqc.org/facility-performance-dashboard>

Physics Data Dashboard: <https://www.mroqc.org/physics-dashboard>

MROQC Physics & Dosimetry Resources: A copy of this document and other physics & dosimetry related resources may be found at the following link:

<https://www.mroqc.org/physics-resources>

### **Contact:**

If you have questions after training, please don't hesitate to email [support@mroqc.org](mailto:support@mroqc.org)! This is strongly encouraged over contacting individual team members.

# Projects

All projects require physics survey submission along with DICOM data upload if applicable.

## 1. MROQC Database

**Breast:** The Breast Radiotherapy Technical Details form (BRTD) is required for all patients. Full DICOM data upload is required for EBRT only. In the case of incomplete treatment, only enter physics data if the patient has received 50% or more of their fractions.

**Lung:** The Lung Radiotherapy Technical Details form (LRTD) and full DICOM data upload is required for each patient. In the case of incomplete treatment, only enter physics data if the patient has received 50% or more of their fractions.

## 2. Bone Mets Database

The Bone Mets Radiotherapy Technical Details form (MRTD) is required for each treated plan; therefore, it is possible for a patient to have multiple MRTDs. In addition, a patient can be retreated, so it is necessary to enter the RT start date on each form in the Bone Mets database to assist in data management. Full DICOM data upload is only required for a patient's first complex course (**SBRT and/or IMRT**). In the case of incomplete treatment, enter physics data if the patient has received *any* treatment.

## 3. Prostate Database

The Prostate Radiotherapy Technical Details form (PRTD) and full DICOM data upload is required for each patient. The patient needs to be matched (MUSIC site) or have a P7 form uploaded. In the case of incomplete treatment, only enter physics data if the patient has received 50% or more of their fractions.

Project Name	Physics Survey		Full DICOM Data
Breast	BRTD		EBRT patients only
Lung	LRTD		All patients
Bone Mets	MRTD for each <b>plan</b>		First complex course
Prostate	Match Site: PRTD entered if patient has matched or has P7 form completed	P7 Site: PRTD entered for all eligible patients	All who meet PRTD criteria

## Uploading Survey Data

### Physics Form:

- Log into the database that corresponds with the patient's cancer type. Click on the name of your institution to see a list of enrolled patients. Navigate to the patient record using the MRQOC ID search on the site page or by editing the web address.

**Subjects**

MROQC ID Search

Status:  Cancer Type:

Tip: A quick way to access a patient record is to enter the MROQC ID in the webpage address.

[access.mroqc.org/node/28454](https://access.mroqc.org/node/28454)

- Once you open the desired patient record, click on the "Enter Physics Data" tab. Click "Create Survey Entry" to begin the patient-specific physics survey.

**4-Physics Data**

**Breast Radiotherapy Technical Details Form**

<b>Completed</b>	<b>Take Survey</b>	<b>Eval Date</b>	<b>View Survey</b>
<a href="#">Create survey entry</a>			

- Complete the physics survey. Note that branching logic is used in the online form, so additional questions may appear based on responses entered.

Example of BRTD form survey.  
All MROQC surveys have a similar format.

- Once the form is submitted, the database will display the date and time of completion of the form.

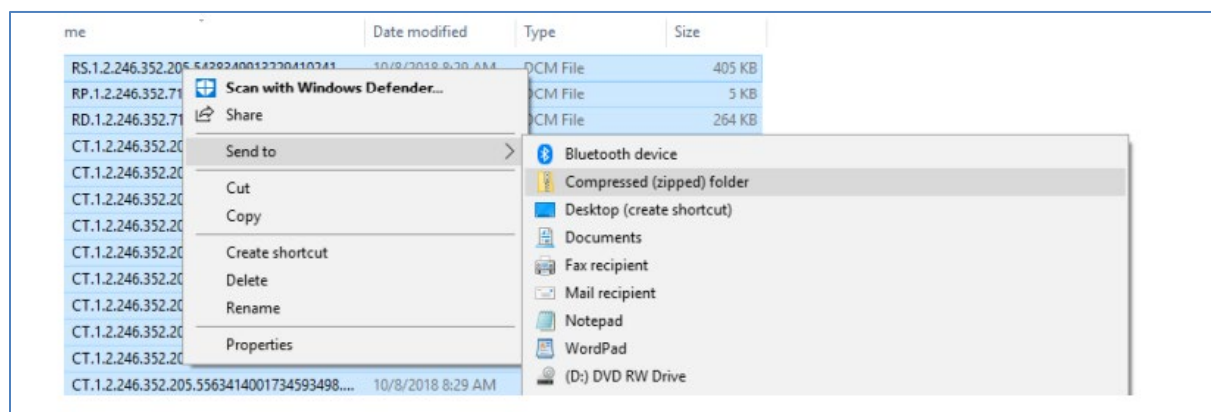
**Breast Radiotherapy Technical Details Form**

<b>Completed</b>	<b>Take Survey</b>	<b>Eval Date</b>	<b>View Survey</b>
<a href="#">2022-06-07 11:06</a>	<a href="#">Retake Survey</a>		<a href="#">View results</a>

## Uploading DICOM Data

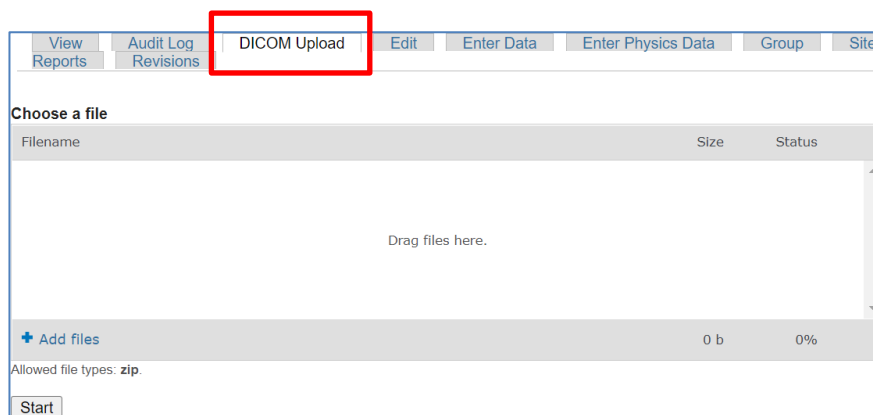
### DICOM Data:

- Preparation:
  - Ensure that all required structures have TG-263 compliant names. See the Physics Tip Sheet (also included in appendix of this document for convenience) for required structures. **Note:** Many abstractors print off the tip sheet as a handy reference. Use the [TG263 Structures Spreadsheet](#) if you are unsure if a required structure name is TG-263 compliant.
  - Export DICOM files from your TPS:
    - Imaging series (CT, MR, US)
    - RTplan
    - RTDose: one per plan. Please do not submit one per beam. It is not necessary to create a Dose Sum for submission to MROQC.
    - RTstruct
    - Please do not submit RTRecord or RTImage format files. These cannot be anonymized by the MROQC tool and will be rejected at the time of upload.
  - Compress DICOM files into a zip folder for upload. Do not use any sub-folders. If a patient was resimulated, include the files for all treatments in a single zip folder. The upload tool will sort and summarize the files by series.

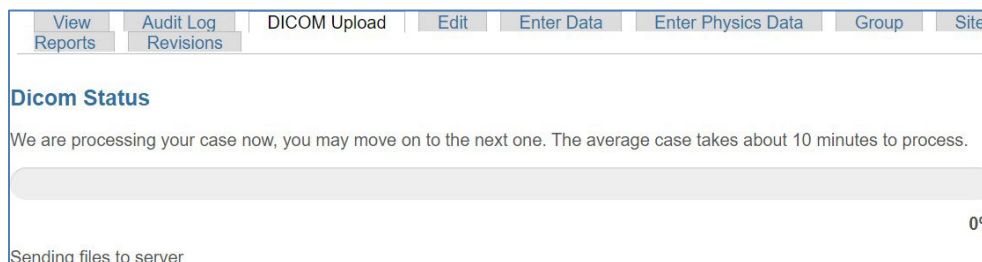


## DICOM Data (continued):

- Click on the “DICOM Upload” tab in the database for the desired patient.



- Drag the compressed folder into the box where it says “Drag files here” or click “Add files” in the lower left corner of the tool. Click “Start” to submit the files. A progress bar will appear.



During the upload process, files are anonymized and summarized. Once the files are finished uploading, a summary report will appear for your review. The report includes a file summary, beam summary, and DVH data. Please review each section of the report to ensure the files were interpreted correctly by the DICOM upload tool.

DICOM data uploads typically take less than 10 minutes, depending on the size of the upload and available computing resources for the upload tool. If the upload is taking longer than 30 minutes, please contact [support@mroqc.org](mailto:support@mroqc.org) for assistance.

View Audit Log DICOM Upload Edit Enter Data Enter Physics Data Revisions

Upload a different file Print

**Patient: '24848' ID:24848**

**Report generated: 2022-08-29 12:19:17**

CT scan summary

Study ID	Series #	CT Datetime	Slices	Num plans	Num doses	Errors
none	1	20180709 102134.723000	43	1	1	

Study id: none; Study Description: none  
 CT series: '1' Study Date/time: 20180709 102214.987000 (43 images)  
 --- Plan Details ---  
 Plan 'Placeholder':

Plan 'Placeholder' Beam Summary

Beam #	Name	Type	Rad Type	Energy	Gantry	Fxn Gp 1 1 fxn Rx: Unknown
1	Field 1	STATIC	PHOTON	6	0	113.8870809 MU

**Note:** The DICOM upload tool summary may show a warning that structures are missing. There will be text “Best guess:” followed by a project (breast, lung, prostate, or mets). If the DICOM upload tool is not correctly guessing which project this case belongs to, you can safely ignore this error message. The upload tool is not connected to physics survey responses and does not reflect how the data for that case is processed for data checker errors and incentive program compliance.



## Power BI Reports

All reports related to incentive program performance, clinical data quality, and physics data quality are on the MROQC website as embedded Power BI reports. There are two reports that are essential to regularly check as a physics abstractor – the facility performance dashboard and the physics data dashboard. Please download and read the [User Guide](#) which explains how to set up your free Power BI access, how to navigate and interpret the facility performance dashboard, and how to export Power BI reports to PDFs. Afterwards please go through the following section, which is a brief tutorial on using the Physics Data Dashboard report. As always, please send an email to [support@mroqc.org](mailto:support@mroqc.org) if you are having any issues using these reports but we encourage you to use this document as a reference.

### Physics Data Dashboard

There are four report tabs (on the left side with icons):

- **Physics missing data:** Shows cases that do not have physics data uploaded yet. There are 4 tabs on the top of the report (for breast, lung, bone mets, and prostate patients) to navigate between projects.

The screenshot shows the MROQC Breast Project Physics Missing Data Report interface. At the top, there are four tabs: Breast Missing Data, Lung Missing Data, Bone Mets Missing Data, and Prostate Missing Data. The main content area displays the report title "BREAST PROJECT PHYSICS MISSING DATA REPORT" and includes filters for Facility (CW), RT Start Date (1/2/2024 to 12/30/2025), and a date range "Up to date as of 02/06/2025". A table with columns for MROQC ID, Enrollment Date, RT End Date, Weeks Since Enrollment, Weeks Since RT End, and Missing Label is visible. The left sidebar contains icons for Physics Missing Data, Physics Timeliness, Physics Data Checker, and Instructions.

- **Physics timeliness:** Shows performance for physics timeliness for your facility overall. The P4P incentive target for physics timeliness is >85% of patients in the performance

year have data submitted within 6 weeks of RT end. Make sure to regularly check the RT end date column in the physics missing data report to ensure data is submitted within 6 weeks of RT end date.

Note: Timeliness is based on both survey data submission AND DICOM data submission, so we encourage you to upload both in the same abstraction session.

**MROQC**  
MICHIGAN RADIATION ONCOLOGY  
QUALITY CONSORTIUM

**PHYSICS TIMELINESS FOR ALL PROJECTS**

**Measure 2A:** Physics & dosimetry information is submitted within 6 weeks of end of treatment for  $\geq 85\%$  of breast, lung, bone mets, and prostate patients from the 2025 performance year. Patients with an RT start date of 1/1/25-9/30/25 are included in the 2025 performance year.

Facility: CW

Up to date as of 02/06/2025

**Physics Missing Data**

**Physics Timeliness**

**Physics Data Checker**

**Instructions**

**Number of Patients Meeting the Physics Timeliness Measure across all Projects**

(Blank)

**Percent of Cases with Data Submitted within 6 weeks of End of Treatment**

Goal: 85% Timely

**PHYSICS TIMELINESS FALLOUTS**

MROQC ID	Project	Timeliness Fallout Reason
----------	---------	---------------------------

- **Physics data checker:** Shows data quality errors for submitted cases. There are five tabs on the top of the report, the first being the overall error-free rate and the other four to navigate between projects. The P4P incentive target is  $\geq 95$  percent cases without a data check error for cases in the performance year, though we encourage you to clear all data check errors so the data can be properly used for quality improvement analysis. There is a problem key on the right side of the report that shows which problem is associated with which number.

Note: If you think a case has been improperly flagged with an error, please reach out to us immediately at [support@mroqc.org](mailto:support@mroqc.org).

- **Instructions:** This tab shows a diagram of the report (shown below) to help you take advantage of the functionality of the Power BI interface. The steps for exporting the report as a PDF are also included below the diagram.

Some additional general tips are shown below. Please zoom in to see tips in the speech boxes.

## General Tips For Using the Report

The screenshot shows the MRQC Breast Missing Data Report interface. The top navigation bar includes tabs for 'Breast Missing Data', 'Lung Missing Data', 'Bone Mets Missing Data', and 'Prostate Missing Data'. The 'Breast Missing Data' tab is selected and highlighted in dark blue. Below the navigation bar, there is a 'Select A Facility' dropdown menu with 'CW' selected. To the right of the dropdown is an 'Enrollment Date' range selector with a slider between '1/1/2024' and '12/13/2024'. Below the enrollment date selector is a table header with columns: 'MROQC ID', 'Enrollment Date', 'Treatment End Date', 'Wks Since Enrollment', 'Wks Since EOT', and 'Missing Label'. The 'Missing Label' column has an upward-pointing arrow icon. On the left side, there is a sidebar with buttons for 'Physics Missing Data', 'Physics Timeline', 'Physics Data Checker', and 'Instructions'. The 'Physics Missing Data' button is highlighted in dark blue.

**MRQC**  
MICHIGAN RADIONUCLIDE ONCOLOGY  
QUALITY CONSORTIUM

Breast Missing Data Lung Missing Data Bone Mets Missing Data Prostate Missing Data

Select A Facility  
CW

Enrollment Date  
1/1/2024 12/13/2024

Physics Missing Data

Physics Timeline

Physics Data Checker

Instructions

BREAST PROJECT DATA REPORT

MROQC ID Enrollment Date Treatment End Date Wks Since Enrollment Wks Since EOT Missing Label

Choose your facility to see your facility's data. The default is always CW.

Use the buttons on the top to move between projects. The selected project is highlighted in dark blue.

Move the slider to filter data by Enrollment Date. Alternatively, you can choose dates by clicking on the numbers.

Click on the buttons to move between tabs. The selected button is highlighted in dark blue.

You can sort data in the table by clicking on the column name. Double click the column name to sort descending. You can sort data by any column so you can choose any column listed in the table. The default sort is Enrollment Date descending.

## How to Complete Training

To obtain credit for completing training, please submit a ticket or email [support@mroqc.org](mailto:support@mroqc.org) with the subject “Physics Training Completed”.

Someone from the MROQC Physics team will reach out to schedule a brief check-in about a month after training is completed.

If you have any questions, please submit a ticket or email [support@mroqc.org](mailto:support@mroqc.org).

Thank you!

# Appendix: Physics Tip Sheet

## [Download Physics Tip Sheet](#)



### Physics Tip Sheet

For any additional questions, please email [support@mroqc.org](mailto:support@mroqc.org)

Last Updated December 2024



Breast	Lung																																
<table border="1"> <tr> <th colspan="2">TG-263 Required Structures:</th> </tr> <tr> <td>All Patients:</td> <td>Node Positive Patients (only regions irradiated):</td> </tr> <tr> <td>CTVsb</td> <td>LN_Ax_L1_L/R</td> </tr> <tr> <td>PTVsb</td> <td>LN_Ax_L2_L/R</td> </tr> <tr> <td>Heart</td> <td>LN_Ax_L3_L/R</td> </tr> <tr> <td>Lung_L/R</td> <td>LN_BMN_L/R or LN_BMNc</td> </tr> <tr> <td>PTV_Breast_L/R (whole breast)</td> <td>LN_Sclav_L/R</td> </tr> <tr> <td>Breast_L/R (partial breast)</td> <td></td> </tr> </table> <p><b>Full DICOM Upload Requirements (EBRT only):</b></p> <ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul> <p><b>Physics Form: Filled out once per patient at the end of treatment</b></p> <ul style="list-style-type: none"> <li>• Breast Radiotherapy Technical Details Form (BRTD)</li> </ul> <p><b>2025 Quality Measures:</b></p> <ul style="list-style-type: none"> <li>• Increase utilization of prone positioning for breast patients (30% target collaborative wide)</li> <li>• Fewer than 5% of 2024 patients have a quality report error as of 12/31/25</li> </ul>	TG-263 Required Structures:		All Patients:	Node Positive Patients (only regions irradiated):	CTVsb	LN_Ax_L1_L/R	PTVsb	LN_Ax_L2_L/R	Heart	LN_Ax_L3_L/R	Lung_L/R	LN_BMN_L/R or LN_BMNc	PTV_Breast_L/R (whole breast)	LN_Sclav_L/R	Breast_L/R (partial breast)		<table border="1"> <tr> <th>TG-263 Required Structures:</th> <th>Required if within 2 cm of PTV</th> <th>Full DICOM Upload Requirements:</th> </tr> <tr> <td>GTV/IGTV/ITV</td> <td>Chestwall / Rib or Ribs</td> <td rowspan="6"> <ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul> </td> </tr> <tr> <td>PTV</td> <td>GreatVes</td> </tr> <tr> <td>Esophagus</td> <td>Bronchus_Prox</td> </tr> <tr> <td>Heart</td> <td></td> </tr> <tr> <td>Lungs-GTV/IGTV/ITV</td> <td></td> </tr> <tr> <td>SpinalCord or SpinalCanal</td> <td></td> </tr> </table> <p><b>Physics Form: Filled out once per patient at the end of treatment</b></p> <ul style="list-style-type: none"> <li>• Lung Radiotherapy Technical Details Form (LRTD)</li> </ul> <p><b>2025 Quality Measures:</b></p> <ul style="list-style-type: none"> <li>• Conventionally fractionated patients: mean esophageal dose is &lt;29 Gy AND esophageal D2cc is &lt;61 Gy</li> <li>• SBRT patients with 1 PTV: Paddick Conformity Index is <math>\geq 0.85</math></li> <li>• Fewer than 5% of 2024 patients have a quality report error as of 12/31/25</li> </ul>	TG-263 Required Structures:	Required if within 2 cm of PTV	Full DICOM Upload Requirements:	GTV/IGTV/ITV	Chestwall / Rib or Ribs	<ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>	PTV	GreatVes	Esophagus	Bronchus_Prox	Heart		Lungs-GTV/IGTV/ITV		SpinalCord or SpinalCanal	
TG-263 Required Structures:																																	
All Patients:	Node Positive Patients (only regions irradiated):																																
CTVsb	LN_Ax_L1_L/R																																
PTVsb	LN_Ax_L2_L/R																																
Heart	LN_Ax_L3_L/R																																
Lung_L/R	LN_BMN_L/R or LN_BMNc																																
PTV_Breast_L/R (whole breast)	LN_Sclav_L/R																																
Breast_L/R (partial breast)																																	
TG-263 Required Structures:	Required if within 2 cm of PTV	Full DICOM Upload Requirements:																															
GTV/IGTV/ITV	Chestwall / Rib or Ribs	<ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>																															
PTV	GreatVes																																
Esophagus	Bronchus_Prox																																
Heart																																	
Lungs-GTV/IGTV/ITV																																	
SpinalCord or SpinalCanal																																	
<p style="text-align: center;"><b>Bone Mets</b></p> <table border="1"> <tr> <th>TG-263 Required Structures:</th> <th>Full DICOM Upload Requirements:</th> </tr> <tr> <td>PTV</td> <td> <ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul> </td> </tr> </table> <p><b>DICOM Collection:</b></p> <ul style="list-style-type: none"> <li>• Full DICOM only for FIRST complex course</li> </ul> <p><b>Physics Forms: Filled out once per each plan in a course at the end of treatment</b></p> <ul style="list-style-type: none"> <li>• Bone Mets Radiotherapy Technical Details Form (MRTD)</li> <li>• Report plans in the same course if plans are adjacent or overlapping in time</li> <li>• Report a new course start date if there is a break other than a weekend</li> </ul> <p><b>2025 Quality Measures:</b></p> <ul style="list-style-type: none"> <li>• Use of shorter course radiotherapy (<math>\leq 5</math> fractions at your facility)</li> <li>• Re-irradiation: physics consulted before final physician approval of plan for Type 1 reirradiation (Overlap of irradiation volumes) OR Type 2 reirradiation (No overlap but concern for toxicity).</li> <li>• Fewer than 5% of 2024 patients have a quality report error as of 12/31/25</li> </ul>	TG-263 Required Structures:	Full DICOM Upload Requirements:	PTV	<ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>	<p style="text-align: center;"><b>Prostate</b></p> <table border="1"> <tr> <th>TG-263 Required Structures:</th> <th>Full DICOM Upload Requirements (EBRT &amp; Brachytherapy):</th> </tr> <tr> <td>CTVp/CTVsb</td> <td rowspan="4"> <ul style="list-style-type: none"> <li>• Image Set (CT, MR, US)</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul> </td> </tr> <tr> <td>PTVp/PTVsb</td> </tr> <tr> <td>Bladder</td> </tr> <tr> <td>Rectum</td> </tr> </table> <p><b>Physics Form: Filled out once per patient at the end of treatment</b></p> <ul style="list-style-type: none"> <li>• Prostate Radiotherapy Technical Details Form (PRTD)</li> </ul> <p><b>2025 Quality Measures:</b></p> <ul style="list-style-type: none"> <li>• EBRT patients: Increase MRI utilization for intact prostate cancer</li> <li>• Fewer than 5% of 2024 patients have a quality report error as of 12/31/25</li> </ul>	TG-263 Required Structures:	Full DICOM Upload Requirements (EBRT & Brachytherapy):	CTVp/CTVsb	<ul style="list-style-type: none"> <li>• Image Set (CT, MR, US)</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>	PTVp/PTVsb	Bladder	Rectum																					
TG-263 Required Structures:	Full DICOM Upload Requirements:																																
PTV	<ul style="list-style-type: none"> <li>• CT</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>																																
TG-263 Required Structures:	Full DICOM Upload Requirements (EBRT & Brachytherapy):																																
CTVp/CTVsb	<ul style="list-style-type: none"> <li>• Image Set (CT, MR, US)</li> <li>• Dose</li> <li>• Plan (scaled to delivered fx)</li> <li>• Structures</li> </ul>																																
PTVp/PTVsb																																	
Bladder																																	
Rectum																																	