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Radiotherapy Dataset v5.0 (RTDS)
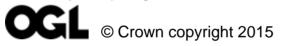
Test Strategy & Report

National Information Standard (SCCI0111)

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Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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Reviewer:
This document must be reviewed by the following:

Name	Organisation	Version	Date
Dr Jem Rashbass	Director, National Disease Registration, Public Health England	v0.5	30/09/15

Approvals:
The following must approve this document:

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Dr Jem Rashbass	Director, National Disease Registration, Public Health England	v0.5	30/09/15

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1. Background

The management and delivery of the National Radiotherapy Dataset (RTDS) standard (SCCI0111) until March 31st 2016 lies with the National Clinical Analysis and Specialised Applications Team (NATCANSAT) that is based at The Clatterbridge Cancer Centre NHS Foundation Trust. The National Cancer Registration Service (NCRS) within Public Health England (PHE) will take over full responsibility for the RTDS standard and data set with effect from 1 April 2016.

The purpose of the Standard is to encourage every NHS acute Trust provider of radiotherapy services supported by their system suppliers to capture and report a defined and controlled data set that will provide nationally comparable data to inform the future planning, provision and commissioning of radiotherapy services within the NHS. It will also provide a rich source of information to support research into new treatments and delivery techniques.

The purpose of this document is to outline the testing strategy and plan aimed at all providers of radiotherapy services involved with or affected by the national collection and analysis and reporting of radiotherapy data.

2. Testing Objectives

The purpose of testing is to ensure that the processes for extracting radiotherapy data from Oncology Management Systems (OMS), allow secure transmission of the data set from provider organisations to the National Cancer Registration Service (NCRS) and pass the quality assurance and upload validations. The testing extends to tests of the published documentation that will support these processes (Requirements Specification, Implementation Guidance and Change Specification).

There are three OMS's in use by the 50 radiotherapy providers in the NHS in England. These are:

- ARIA (Aria Oncology)
- MOSAIQ (Mosaiq Oncology)
- Bespoke (Royal Marsden Hospital)

3. Testing Strategy and Approach

The phases of implementation and testing are illustrated on the Gantt chart below:

PHASE	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16
1 - Receive Test data from RT centres across England	■								
2 - Determine hosting location and ensure infrastructure is in place.	■								
3 - Design and implement validation and quality assurance checks on data.	■	■							
4 - Map all incoming data formats into standard RTDS.		■	■						
5 – Implement data upload portal.			■	■	■				
6 - Provide complex real-time validation reports to Trusts			■	■	■				
7 - Provide analytical reports to Trusts				■	■				
Full End-to-end testing of upload and validation process						■	■	■	
Live Launch									■

Test Phase 1 - Receive Test data from RT centres across England

August 2015

Requirements:

The first phase of testing has been to request data extracts from service providers in order to confirm basic extraction capabilities and checks for file content and completeness. During August and September of 2015 all of the providers were contacted and test extracts of data from Oncology Management Systems were requested.

The expected output was as follows:

ARIA

6 x CSV files (Titled 1,2a, 2b, 3, 4, and 5) and example of PAS linkage file. These are:

1.csv for report 'r_1_patient'
2a.csv for report 'r_2a_appointment'
2b.csv for report 'r_2b_task'
3.csv for report 'r_3_prescription'
4.csv for report 'r_4_treatment_history'
5.csv for report 'r_5_diagnosis'

MOSAIQ

Excel Spreadsheet or Access Database containing 11 data tables:

Admin, Charge, CPT, Dose_Hst, Ident, Medical, PatCPlan, Patient, Site, Staff

Plus extract from PAS system

The Royal Marsden NHS Foundation Trust – *Using Bespoke*

Single CSV file containing complete un-normalised dataset.

Test Results:

As of September 2015 20/50 extracts had been received from a selection of ARIA and MOSAIQ systems and the Royal Marsden bespoke system.

Data extracts were successfully transmitted via secure e-mail or SFT (Secure File Transfer) to the NCRS as follows:

Trust name	System	Format received	Months Received							
			Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15
Northampton General Hospital NHS Trust	ARIA	6 x csv	■	■	■	■	■	■	■	■
United Lincolnshire Hospitals NHS Trust	ARIA	6 x csv						■		
University Hospitals of Leicester NHS Trust	ARIA	6 x csv							■	■
Cambridge University Hospitals NHS Foundation Trust	MOSAIQ	Access							■	
East and North Hertfordshire NHS Trust	ARIA	6 x csv								■
Ipswich Hospital NHS Trust	ARIA	6 x csv	■	■	■		■			
Norfolk and Norwich University Hospitals NHS Foundation Trust	ARIA	6 x csv	■	■	■	■	■	■	■	
Peterborough and Stamford Hospitals NHS Foundation Trust	ARIA	6 x csv	■	■	■	■	■	■	■	■
Barking, Havering and Redbridge University Hospitals NHS Trust	ARIA	6 x csv				■	■			
Barts Health NHS Trust	ARIA	6 x csv							■	■
Brighton and Sussex University Hospitals NHS Trust	MOSAIQ	Access				■	■	■		
Imperial College Healthcare NHS Trust	ARIA	6 x csv				■				

Trust	Vendor	Format	1	2	3	4	5	6	7	8
The Royal Marsden NHS Foundation Trust	Bespoke	txt file	✓	✓	✓	✓	✓	✓	✓	✓
The Christie NHS Foundation Trust	MOSAIQ	Excel						✓		
Leeds Teaching Hospitals NHS Trust	MOSAIQ	Access						✓		
Portsmouth Hospitals NHS Trust	ARIA	6 x csv					✓			
Royal Cornwall Hospitals NHS Trust	ARIA	6 x csv				✓	✓	✓		
Royal Devon and Exeter NHS Foundation Trust	ARIA	6 x csv							✓	
Shrewsbury and Telford Hospital NHS Trust	ARIA	6 x csv	✓	✓	✓	✓	✓	✓	✓	✓
University Hospitals Coventry and Warwickshire NHS Trust	MOSAIQ	Excel						✓	✓	

All submissions so far received have been checked against the expected format for each of the vendors and it has been confirmed that all are of the correct format.

Test Phase 2 - Determine hosting location and ensure infrastructure is in place.

August 2015

Requirements:

Server must be in place to commence testing of file submissions and validations.

Test Results:

A hosting server has been procured and is in place ready for development and testing.

The upload portal is hosted at https://nww.api.encore.nhs.uk.

Test Phase 3 - Design and implement validation and quality assurance checks on data.

Aug-Sept 2015

Requirement:

Each of the data items submitted must be subject to validation checks and quality assurance. A list of these checks must be produced and confirmed with radiotherapy management teams and users. The Requirements Specification and the Implementation Guidance will be issued to users to underpin the process and feedback on their content and utility will be invited from all users.

Test Result:

Each data item with be measured for completeness, as well as individual checks on logic and validity as outlined in the table below:

	Logic Checks	Validity Checks
RTDS Episodes		
ATTENDANCE IDENTIFIER		
APPOINTMENT DATE		Date validity check. "yyyy-mm-dd" format. Must be >2008-01-01.
ORGANISATION CODE (CODE OF PROVIDER)		
RADIOTHERAPY EPISODE IDENTIFIER		
EARLIEST CLINICALLY APPROPRIATE DATE	Must be earlier than or equal to APPOINTMENT DATE.	
RADIOTHERAPY PRIORITY		E/U/R/D
DECISION TO TREAT DATE (RADIOTHERAPY TREATMENT EPISODE)	Must be earlier than or equal to APPOINTMENT DATE.	
	Must be earlier than or equal to REFERRAL REQUEST RECEIVED DATE.	
	If RADIOTHERAPY PRIORITY<>"E" must be equal to EARLIEST CLINICALLY APPROPRIATE DATE	
	If RADIOTHERAPY PRIORITY="E" must be earlier than EARLIEST CLINICALLY APPROPRIATE DATE	
TREATMENT START DATE (RADIOTHERAPY TREATMENT EPISODE)	Must be earlier than or equal to APPOINTMENT DATE.	
	Must be later than or equal to DECISION TO TREAT DATE.	
	Must be later than or equal to REFERRAL REQUEST RECEIVED DATE.	
	Must be later than or equal to EARLIEST CLINICALLY APPROPRIATE DATE	
RADIOTHERAPY DIAGNOSIS (ICD)		
RADIOTHERAPY INTENT		01/02/03/99
RTDS Prescriptions		
ATTENDANCE IDENTIFIER		
APPOINTMENT DATE		Date validity check. "yyyy-mm-dd" format. Must be >2008-01-01.

ORGANISATION CODE (CODE OF PROVIDER)		
RADIOTHERAPY EPISODE IDENTIFIER		
PRESCRIPTION IDENTIFIER		
RADIOTHERAPY TREATMENT MODALITY		05/06
RADIOTHERAPY TREATMENT REGION		P/R/PR/A/O/M
ANATOMICAL TREATMENT SITE (RADIOTHERAPY)	Complete if RADIOTHERAPY TREATMENT REGION = "A", "O" or "M" otherwise NULL	Alphanumeric beginning with "Z"
NUMBER OF TELETHERAPY FIELDS	Must be greater than or equal to number of exposures associated with the same prescription.	max N2
RADIOTHERAPY PRESCRIBED DOSE		maxN3.maxN2
PRESCRIBED FRACTIONS	Where PRESCRIBED FRACTIONS and ACTUAL FRACTIONS both present, ACTUAL FRACTIONS must not exceed PRESCRIBED FRACTIONS	>=0 and <101
RADIOTHERAPY ACTUAL DOSE		maxN3.maxN2
ACTUAL FRACTIONS	Should only be present for final fraction of a prescription.	>=0 and <101
	Where PRESCRIBED FRACTIONS and ACTUAL FRACTIONS both present, ACTUAL FRACTIONS must not exceed PRESCRIBED FRACTIONS	
RTDS Exposures		
ATTENDANCE IDENTIFIER		
APPOINTMENT DATE		Date validity check. "yyyy-mm-dd" format. Must be >2008-01-01.
ORGANISATION CODE (CODE OF PROVIDER)		
RADIOTHERAPY EPISODE IDENTIFIER		
PRESCRIPTION IDENTIFIER		
RADIOTHERAPY FIELD IDENTIFIER		
TIME OF EXPOSURE		
MACHINE IDENTIFIER		
RADIOTHERAPY BEAM TYPE		T1/T2/T3
RADIOTHERAPY BEAM ENERGY		maxN3.maxN3
RADIOISOTOPE		

To be completed:

The validation checklist is currently being circulated to RTDS contacts for sense checking and sign-off. (Completion Date: 30 Sep 2015).

The Requirements Specification, Change Specification and Implementation Guidance will be issued to all providers with a request to feedback on content and utility.

A report will be provided in real time to the submitting trust showing validation failures or breaches of the above rules (see testing Phase 6).

Test Phase 4 - Map all incoming data formats into standard RTDS.

Sep-Dec 2015

Requirement:

Each of the 50 data submissions we expect to receive as standard each month must be mapped to data items in the RTDS and the Outpatient Commissioning Data Set (OPCDS) and stored in a standard format for all trusts.

This data then needs to be loaded into the national cancer registration system, ENCORE for processing and reporting.

Test Result:

Standard mapping documents have been produced for the three expected data submission formats –ARIA, MOSAIQ and RMH. All of the received (as of Sep 2015) data so far has been successfully mapped.

To be completed:

The remaining 30 submissions must be received and mapped.

All data must be stored in data warehouse on ENCORE for analysis and reporting (Completion date 31 Oct 2015)

Test Phase 5 - Implement data upload portal

Oct-Dec 2015

Requirement:

The PHE RTDS Upload portal will be developed to allow providers to directly upload their monthly submissions. This portal will also provide reporting and supplementary information to assist providers with the dataset. Again all of the published documentation will be tested for how they support these processes and feedback will be invited from all providers.

Test Result:

TBC

To be completed:

Portal will be developed at https://nww.api.encore.nhs.uk.

It is anticipated that the secure upload mechanism will be available for testing from October 2015. All trusts who have submitted a test file (see Test Phase 1 for current list) will be contacted and asked to submit data via this mechanism. Data will then be checked against existing data for any disparities.

All of the published documentation will be available to users via the portal and further supporting documentation now in development will be made available from mid-October. Providers will be asked to review and feedback on the content of the portal and all documentation intended to support these processes.

Test Phase 6 - Provide complex real-time validation reports to Trusts

Oct-Dec 2015
Dependency: Completion of Test Phase 3

Requirement:

When a file is uploaded through the NCRS secure portal, a large number of completeness, logic and validity checks will be carried out in real-time (see Test Phase 3 for details).

Providers will receive instant feedback on their submission through the portal

Test Result:

TBC

To be completed:

When a file is uploaded, an instant report will be provided to the submitter. Mechanisms will be in place to allow the user to correct any errors that are identified or to resubmit the file.

Record level detail will be provided to the user to allow errors to be located on local systems and rectified.

Work to commence on validation reports once Test Phase 3 is completed and signed off by testers.

All submitting trusts will be asked to test the validation reports, the Requirements Specification and the Implementation Guidance to assure they provide the right level of support and accuracy.

Test Phase 7 - Provide analytical reports to Trusts

Nov-Dec 2015

Requirement:

Analytical reports must be made available for users on the NCRS CancerStats web portal: https://nww.cancerstats.nhs.uk/users/sign_in

The following reports will be produced:

National Reports
　　　　　Number of Linacs in Use
　　　　　Age Profile of Linacs
　　　　　Attendances per m pop by Network
　　　　　Attendances per m pop by Provider
　　　　　Linacs per m pop
　　　　　Machine Attendances per Linac
　　　　　Opening Hours by Provider
　　　　　Percentage of IMRT Episodes by Provider
　　　　　Attendances
　　　　　Attendances by Machine Type per Provider
　　　　　Attendances by Network of Patient
　　　　　Attendances by Network of Patient
　　　　　Attendances by PCT in Network of Patient with Provider
　　　　　Attendances by Provider
　　　　　Attendances by Provider in Network
　　　　　Attendances for Provider by CCG
　　　　　Attendances for Provider by PCT
　　　　　Episodes
　　　　　Episodes by Network of Patient
　　　　　Episodes by PCT
　　　　　Episodes by PCT in Network of Patient
　　　　　Episodes by Provider
　　　　　Episodes by Provider in Network
　　　　　Machine Attendances
　　　　　Machine Attendances by Machine
　　　　　Machine Attendances by Machine Identifier and Day of Week
　　　　　Machine Attendances by Machine Identifier in Network of Provider
　　　　　Prescriptions
　　　　　Prescriptions by Network of Patient
　　　　　Prescriptions by Provider
　　　　　Prescriptions by Provider in Network
　　　　　Productivity
　　　　　HRG Preparation Code
　　　　　HRG Treatment Code
　　　　　OPCS Codes

Working Day Profile of Linear Accelerator
IMRT by Provider
QIPP
Bone Mets QIPP by Provider
Breast QIPP by Provider (15 Attendances)
Breast QIPP by Provider (20 Attendances)

Test Result:

TBC

To be completed:

Reports to be produced and tested by users by 31 Dec.

4. End-To-End Testing and Launch

The portal will be fully developed and tested by December 31st 2015 and trusts will be contacted to carry out end-to-end testing of the upload, validation and reporting from 1st January 2016.

Data submissions for January, February and March 2016 to PHE will be delivered only through the NCRS upload portal. All reporting and feedback delivered will be compared with the existing reports provided by NATCANSAT for consistency checking.

All published documentation and other supporting information will be tested with users to ensure that they are accurate and support the processes from the point of data extraction, to submission, to QA and validation and onto reporting and feedback.

The portal will be launched on 1st April 2016 ready to receive the notifications relating to April 2016 and due for submission 15 operational days post the month end.

5.   Mitigations for Delay

Level 1

The Test Strategy and Plan describes seven phases of testing. Within this cycle it is expected that the RTDS submissions portal will be fully functional by December 2016. This allows a three months window of time between January 2016 and March 2016 to fully test the upload, quality assurance, validation, feedback and reporting functions of the portal with all 50 Radiotherapy providers before go live. A one month delay in the completion of the submissions portal would reduced this to two months of operational testing and by extension a two months' delay would reduced this to one month of operational testing.

Level 2

Should the delay in delivering the fully functional portal extend beyond three months then this would threaten the timelines for the collection and submission of the April 2016 data that is due to be submitted by 20th May 2016 and by extension each further month of delay would impact the go-live date. The mitigation for short-term delays of up to 3 months would be that the NCRS would receive the RTDS data by SFT or secure e-mail in csv, access or xls formats as necessary and perform a more manual validation and quality assurance of the data. The NCRS has dedicated quality assurance staff in each of its 8 regional offices who would be available for this work. These processes may take relatively more time to undertake and so there could be slippage in the timeliness of feedback and reporting.

Level 3

Should the delay in delivering the fully functional portal become subject to more serious time delays the NCRS will contract with the NATCANSAT team to extend their data submissions management through their proprietary toolkit. PHE would have to bear the costs of such an arrangement until it was no longer necessary.

Appendix 1 – System Suppliers in use across England

NHS Trust Radiotherapy Provider	Oncology Management System
Barking, Havering and Redbridge University Hospitals NHS Trust	ARIA
Barts Health NHS Trust	ARIA
Colchester Hospital University NHS Foundation Trust	ARIA
East and North Hertfordshire NHS Trust	ARIA
Gloucestershire Hospitals NHS Foundation Trust	ARIA
Hull and East Yorkshire Hospitals NHS Trust	ARIA
Imperial College Healthcare NHS Trust	ARIA
Ipswich Hospital NHS Trust	ARIA
Maidstone and Tunbridge Wells NHS Trust	ARIA
Norfolk and Norwich University Hospitals NHS Foundation Trust	ARIA
North Cumbria University Hospitals NHS Trust	ARIA
Northampton General Hospital NHS Trust	ARIA
Oxford University Hospitals NHS Trust	ARIA
Peterborough and Stamford Hospitals NHS Foundation Trust	ARIA
Plymouth Hospitals NHS Trust	ARIA
Portsmouth Hospitals NHS Trust	ARIA
Royal Cornwall Hospitals NHS Trust	ARIA
Royal Devon and Exeter NHS Foundation Trust	ARIA
Royal Free Hampstead NHS Trust	ARIA
Royal Surrey County NHS Foundation Trust	ARIA
Royal United Hospital Bath NHS Trust	ARIA
Sheffield Teaching Hospitals NHS Foundation Trust	ARIA
Shrewsbury and Telford Hospital NHS Trust	ARIA
The Clatterbridge Cancer Centre NHS Foundation Trust	ARIA
United Lincolnshire Hospitals NHS Trust	ARIA
University College London Hospitals NHS Foundation Trust	ARIA
University Hospital of North Staffordshire NHS Trust	ARIA
University Hospitals of Leicester NHS Trust	ARIA
The Royal Marsden NHS Foundation Trust	Bespoke
Brighton and Sussex University Hospitals NHS Trust	MOSAIQ
Cambridge University Hospitals NHS Foundation Trust	MOSAIQ
Derby Hospitals NHS Foundation Trust	MOSAIQ
Guy's and St Thomas' NHS Foundation Trust	MOSAIQ
Lancashire Teaching Hospitals NHS Foundation Trust	MOSAIQ
Leeds Teaching Hospitals NHS Trust	MOSAIQ
North Middlesex University Hospital NHS Trust	MOSAIQ
Nottingham University Hospitals NHS Trust	MOSAIQ
Poole Hospital NHS Foundation Trust	MOSAIQ

Royal Berkshire NHS Foundation Trust	MOSAIQ
South Devon Healthcare NHS Foundation Trust	MOSAIQ
South Tees Hospitals NHS Foundation Trust	MOSAIQ
Southampton University Hospitals NHS Trust	MOSAIQ
Southend University Hospital NHS Foundation Trust	MOSAIQ
Taunton and Somerset NHS Foundation Trust	MOSAIQ
The Christie NHS Foundation Trust	MOSAIQ
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	MOSAIQ
The Royal Wolverhampton Hospitals NHS Trust	MOSAIQ
University Hospital Birmingham NHS Foundation Trust	MOSAIQ
University Hospitals Bristol NHS Foundation Trust	MOSAIQ
University Hospitals Coventry and Warwickshire NHS Trust	MOSAIQ