INTRODUCTION

The Michigan Radiation Oncology Quality Consortium (MROQC) was created in 2011 with six partner institutions to share best practices in radiation therapy methods and outcomes for early stage breast and lung cancer patients.

MROQC has expanded to 14 institutions statewide to include different types and sizes of practice environments.

A database was created to include physician and patient reported outcomes, physics data, and photographs for breast patients.

Data elements were determined by a multi-disciplinary and multi-institutional team including physicists, physicians, and a statistician.

It is funded by Blue Cross Blue Shield of Michigan and coordinated by the University of Michigan.

GOAL

Describe elements of the physics portion of the database & example analysis regarding practice patterns.

MATERIALS & METHODS

DATABASE

Dynamic graphs created with Matlab for the dose volume histogram (DVH) tool.

Java and Pixelmed DICOM library are used for the DICOM upload tool.

Each patient has an institutional ID only known at the institution and an MROQC ID which denotes the patient in the database.

Each person doing data entry uses two-factor authentication.

Three tools were created to capture physics data: web-based questionnaires, a dose volume histogram wizard, and a DICOM-RT anonymizer for plans.

1. WEB-BASED QUESTIONNAIRES

Facility-specific questionnaire covers hardware, software and standard practices.

Patient-specific questionnaire covers:

- Simulation
- Target definition for breast and lung
- Dose prescription
- Treatment planning
- Treatment delivery

RESULTS (cont.)

User feedback and a review of the data quality have led to the following improvements.

- Web-based questionnaires
- Removal of redundant questions
- Rewording of questions which inadequately captured the actual practice

- DVH tool – breast cancer patients
- Data for the ipsilateral lung structure no longer collected because average doses <2.5 Gy
- Surgical cavity structure optional because it is not always contoured

- DICOM-RT anonymizer tool
- Attestation statement added
- Internal error reporting launched

SUMMARY

A database was created to capture detailed physics information from web-based questionnaires, and DVH and DICOM-RT plan data.

Data continues to be regularly submitted for eligible breast and lung cancer patients.

High quality data are crucial for determining how treatment technique and doses affect patient outcomes.

ACKNOWLEDGEMENTS

The authors acknowledge Tara Hackel, Jennifer Steers, and James Irer who assisted in the design and created some of the software used in the MROQC database. The authors also acknowledge advice provided by Marc Kessler, Wayne Keranen and Eduardo Acosta throughout this process.

This work is funded by Blue Cross Blue Shield of Michigan. The funding body played no role in the design and conduct of the study or preparation, review, or approval of this work.