The Credentialing Process for the NSABP B-51 / RTOG 1304 Phase III Randomized Clinical Trial

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Purpose:

NSABP B-51/RTOG 1304 is a randomized phase III clinical trial evaluating regional nodal (RN) radiotherapy (RT) in patients with positive axillary nodes before neoadjuvant chemotherapy (NC) who convert to negative axillary nodes (ypN0) after NC. Patients following lumpectomy are randomized to whole breast RT (Arm 1A) *v* breast and RN RT (Arm 2A); and post-mastectomy patients are randomized to observation (Arm 1B) *v* chestwall and RN RT (Arm 2B). This is the first multi-institution group trial evaluating breast cancer RN RT, requiring 3DCRT or IMRT treatment plans based on CT contouring with DVH plan evaluation. An institution must be credentialed to demonstrate that physics staff have read the protocol, meet specific technology requirements, and generate RT plans that meet protocol-defined RT dose volume constraints. The credentialing goal is to reduce protocol deviations and provide institutional feedback to correct unacceptable variations before patient enrollment.

Method:

Credentialing includes completing a Facility Questionnaire and developing 3DCRT and/or IMRT treatment plan for 3 CT benchmark cases for: Arm 1A – breast RT only; 2A – breast and RN RT; and 2B – post-mastectomy chestwall and RN RT downloaded from the IROC Houston's website. RN RT includes dose coverage of supraclavicular, axillary, and internal mammary nodes in the first 3 intercostal spaces.

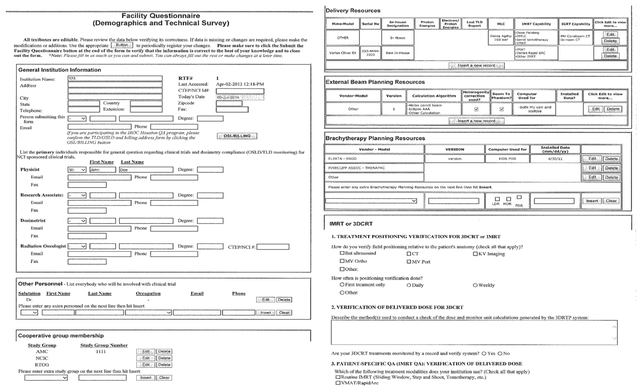

Figure 1: IROC Houston on-line Facility Questionnaire

IROC Houston reviews the benchmarks using MIM to verify that the dose to targets and constraints to organs at risk meet protocol-specified criteria. Credentialed institutions may then enroll patients. The first case enrolled on Arms 2A and 2B undergo pre-treatment review and are scored per protocol: variation acceptable or variation unacceptable.

Method (cont'd):

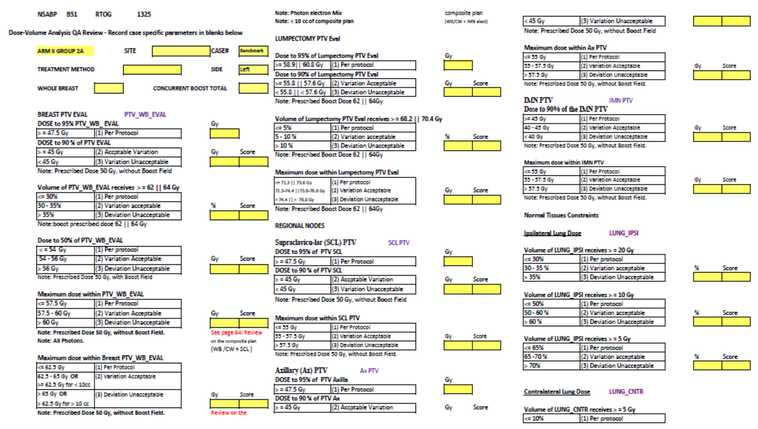

Figure 2: Example of the Dose Volume Analysis (DVA) used for evaluation of treatment plans.

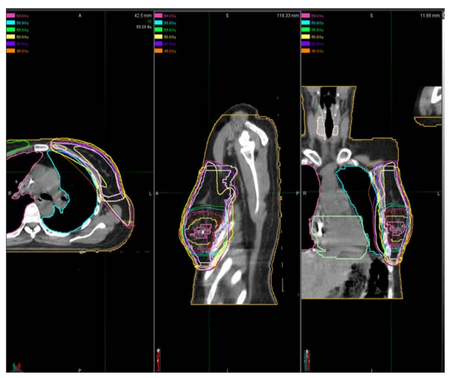

Figure 3: Benchmark for Arm 1/1A

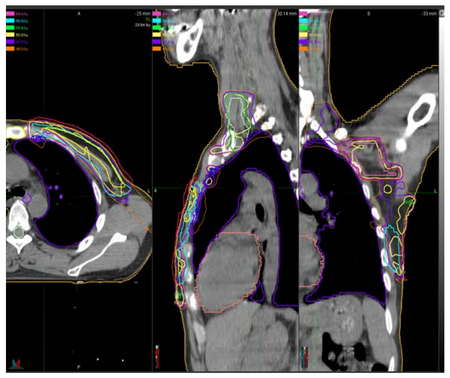

Figure 4: Benchmark for Arm 2/2A

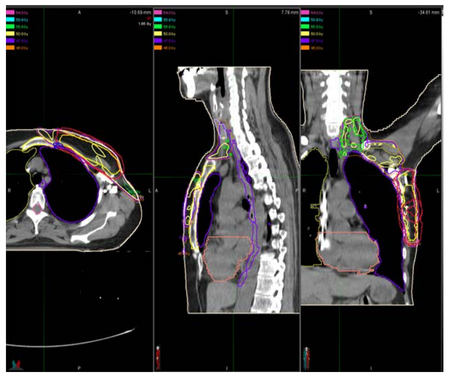

Figure 5: Benchmark for Arm 2/2B

Results:

NSABP B-51/ RTOG 1304 opened August 22, 2013 with a targeted accrual of 1,601. 213 institutions have initiated the credentialing process. 202 that have submitted benchmarks for review with 2% failed and never resubmitted. Credentialed techniques are 7% IMRT only, 52% 3DCRT only, and 41% 3DCRT and IMRT. Benchmark initial failure rates requiring re-submission are: 8% failed the benchmark for breast RT only (1A); 10% failed 2B post-mastectomy chestwall and RN RT; and 34% failed 2A breast and RN RT at least once before being credentialed. 9% of the institutions failed 2A twice and 3 failed three or more times and 9% failed 2A when planned using 3D and IMRT at the same institution. 199 are credentialed to enter patients. 19 enrolled cases have had pre-treatment reviews and 2 scored "unacceptable" with re-submission for re-review due to target volume contouring.

The following are the most common areas of failure for the 1A :

- Lung_IPSI (Lung IPSI re'c 20Gy)
- PTV_WB_EVAL (Dose to 50% of PTV WB)
- PTV_EVAL BREAST (Volume of PTV WB EVAL rec'd 62 Gy)

The following are the most common areas of failure for the 2A :

- PTV_Axilla (Dose to 95%)
- PTV_Axilla (Max point dose w/in PTV_Axilla)
- PTV_EVAL_Breast (Max dose w/in PTV WB)
- Lung_IPSI (Lung IPSI re'c 20Gy)
- PTV_EVAL_BREAST (Dose to 50% of PTV WB)
- PTV_EVAL BREAST (Volume of PTV WB EVAL rec'd 62 Gy)

The following are the most common areas of failure for the 2B :

- PTV_EVAL_CHSTWLL (Dose to 95%)
- PTV_SCL (Dose to 95%)

Conclusions:

NSABP B-51/ RTOG 1304 credentialing prepares institutions for RT delivery to meet protocol requirements. This revealed Arm 2A, breast RT and RN RT has required resubmission most for institutions to meet protocol guidelines.

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