**Initial Physics Review (pre-doc approval / MOSAIQ export):**

**Green = part of PlanCheck script**

**Section 1: Raystation Photons**

* MOSAIQ: File – Demographics – Admission Sub-tab
* Is Admit/Registration Date filled in? If not - inform Amber Spicer (ext 2041) and ask her to enter the most recent registration date BEFORE sending RS Plan to MOSAIQ
* Are there any prior tx’s? If the MD requested a sum, there should be a sum in RS.
* RS: Patient Data Management
* Does the CT Calibration curve on each CT image say HOST-7307? Fix image name, if necessary: plan name and date.
* RS: Patient Modeling: Structure Definition
* Ensure that couch structures are present.
* For Prostate plans, ensure that Bladder, Rectum, Colon\_Sigmoid, and Bag\_Bowel are contoured.
* Ensure that structure names are TG-263 compliant and/or a TG-263 Structure template was used.
* Ensure that External extends all the way to couch with no gap or overlap. (SBRT)
* If beams go through couch (look at dose in Plan Evaluation), ensure that dose grid includes all of couch.
* Scroll through the CT to ensure there are no stray contours (i.e. in the air) or unexpected holes in contours. (PlanCheck simplifies contours.)
* Structures should be marked for export according to the list I gave Kaley (i.e. DVH export as normal, MOSAIQ should only have a few specified structures on the list). MOSAIQ export can be set by running ExcludeFromMOSAIQExport script.
* For SBRT, ensure that distance from iso to farthest point of External/couch on the opposite RL side is <41.5 cm.
  1. Set the viewing planes to the plan isocenter, then scroll to the plane where the patient or couch is extending out at its furthest point. (You may go to visualization – beams – isocenter to turn on the isocenter)
  2. Measure from the iso to the furthest point.
* If there is bolus, ensure there are no gaps. Tell Zach to inform therapists to double wet towel thickness.
* RS: Plan Design
* For SBRT/SRS, ensure that machine is SBRT 6MV.
* If dose specification is a volume other than 100%, double-click the Rx in MOSAIQ and make sure % isodose matches RS.
* For VMAT and SBRT: Beams tab > Patient setup: Check for yellow shifts. (Make sure the calculated shifts make sense visually when viewing the plan Loc Pt and the beam isocenter in the viewing planes.) Ensure that absolute I-S isocenter coordinate <100 cm.

**Note:** If this is a boost, there will be an iso instead of a localization point. So there will be no Patient Setup.

* Beams and Setup Beams tabs: Ensure that all beam names are unique among all treatments.
* Setup Beams tab: Setup beams present? Usually, for prescriptions to a point, one AP kV and one Lateral kV. For prescriptions to an ROI, a CBCT.
* Make sure DSP is either inside of PTV (for volume Rx) or inside the 80% isodose line (for point Rx). Usually, the DSP is at the isocenter so it shouldn’t be a problem.
* Does Prescription match the Rx in MOSAIQ? Plan name in RS should match prescription name in MOSAIQ.
* Is “Auto Scale to prescription” enabled?
* Algorithm should be Collapsed Cone.
* Ensure that dose grid is not smaller than image in any direction. If you resize the dose grid, re-calc final dose.
* RS: Plan Optimization/Plan Evaluation
* Check Clinical Goals. Clinical Goals should contain both OAR and target goals as prescribed by the MD. If the MD provides no target goals, use the following generic goals:
  + - CTV D100%
    - CTV V100%
    - PTV D95%
    - PTV V95%

You may run script AddClinicalGoals.

* **All VMATs**
  + View the movie of the MLC under Visualization (left). Ensure no weird/unexpected MLC positions and ensure that the MLC conforms approximately to the PTV size.
  + In Plan Optimization > Beam Optimization Settings, gantry spacing should be 3 deg (not 4), and delivery time limit should be 120 seconds (not 90). This is true especially if it is difficult to meet constraints, Clinical Goals, etc.
  + Ensure that energy is 6 MV. There should be no VMAT plans with 10 MV, and especially not 18 MV.
  + Constrain leaf motion to 0.5 cm/deg (will have more info on this when annual MLC tests are complete).
  + Check Clinical Goals for anything weird/failing.
  + Optimization settings: Check beam weighting. Check optimization tolerance. It should generally be 10-5 or lower.
* Dose information.

**Note:** Preferred measurement of dose max is point dose, but D0.035cc is acceptable.

* + Right click inside the CT image and select “Localize Dose Max”
  + **non-VMAT plans**
    - Dose maximum should be < 110% of the Rx dose. If it is not, confirm with Dosimetry and/or let physics know, but it likely will not be able to be changed. For a 3D plan there’s really not much you can do to decrease the max dose.
    - ≤3 mm dose grid
  + **non-SBRT VMAT plans**
    - Global Dose maximum should be <110% of the Rx dose. The ideal value is 107–108%.
    - Minimize 105% colorwash (white in CRMC Standard Dose Colorwash). If it is difficult to meet max dose limits, add a high-weighted (maybe 250) uniform dose objective for 102.5% of the Rx.
    - ≤3 mm dose grid
  + **SBRT VMAT plans**
    - RS: Global Dose maximum should be <125% of the Rx dose
      * This is the “ideal” max dose, but sometimes the max dose can go up to 140% in some cases.
    - Plan Setup: Dose Grid Settings
      * Right-Left must be 0.2 cm or less and uniform should be checked.
    - **Lung SBRT plans**: ensure that SBRT Analysis script has been run and that the R50, R100, D2cm, and V20 values are either "None" or "Minor" deviation according to RTOG 0813.
    - ≤2 mm dose grid
    - If we are having a hard time meeting Clinical Goals, reduce gantry spacing to 2°.
* Save the patient.
* Do a dry run of approving the plan (and beam set, if applicable) to make sure that there won’t be any weird errors or other things that the MD will need help with. Stop when you are prompted for your password!
* Save, Close the plan in RS so Dosimetry can complete their tasks.
* Complete your QCL.
* Send QCL to Dosimetry: Physics Review Complete.

**Section 2: Electrons (clinical setup)**

* Go through each field in MOSAIQ for the plan.
* Check that Bolus is entered in “Bolus” near the bottom left (only if the patient has bolus).
* Check that Applicator = “Square” and “FDA” = 1 in the bottom left
* Make sure all Red forms are filled in.
* Tolerance table should be Electrons
* Jaw size will be greyed out because of the tolerance table being electrons, The “Field Size” should be the cone size (i.e. 6 X and 6 Y for 6x6 cone).
* Setup notes should include bolus (if any), cone size, and setup instructions
* Planning worksheet is in Documents. Fractionation on planning worksheet should match the Rx in D and I.